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RECORDER, SALT LAKE COUNTY, UTAH
HERRIMAN
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HERRIMAN UT 84096
BY: ZJM, DEPUTY - WI 87 P.
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HERRIMAN CITY, UTAH

AN AMENDED AND RESTATED MASTER DEVELOPMENT AGREEMENT FOR

ROSECREST MASTER PLAN COMMUNITY

BETWEEN THE CITY AND SOUTH FARMS, LLC AND ROSECREST, INC.

APPROVED BY THE HERRIMAN CITY COUNCIL ON December 18, 2008

OFFICIAL

HERRIMAN CITY
13011 SOUTH PIONEER STREET
HERRIMAN, UT 84096

BK 9679 PG 97

HERRIMAN, UTAH
ORDINANCE NO. 08-26

**AN ORDINANCE ADOPTING AN AMENDED AND RESTATED MASTER
DEVELOPMENT AGREEMENT FOR ROSECREST MASTER PLAN COMMUNITY
BETWEEN THE CITY AND SOUTH FARMS, LLC, AND ROSECREST, INC.**

WHEREAS, the Herriman City Council ("*Council*") met in regular meeting on December 18, 2008, to consider, among other things, adopting an Amended and Restated Master Development Agreement for Rosecrest Master Plan Community between the City and South Farms, LLC, and Rosecrest, Inc. (collectively, "*Rosecrest*"); and

WHEREAS, the City and Rosecrest entered into an original Master Development Agreement ("*Original Agreement*") dated June 26, 2000, to develop approximately 1,040 acres of real property located within the City; and

WHEREAS, from time to time, the Original Agreement was amended.

WHEREAS, on January 1, 2008, certain real property also owned by Rosecrest was annexed to the City; and

WHEREAS, the City and Rosecrest have negotiated an Amended and Restated Master Development Agreement ("*Amended Agreement*") for the original 1,040 acres and 4,000 acres owned by Rosecrest that was annexed as part of the January 1, 2008, annexation; and

WHEREAS, the Amended Agreement has been presented to the Council for review; and

WHEREAS, the Council has determined that it is in the best interest of the health, safety, and welfare of the City residents to amend and restate the Original Agreement.

NOW, THEREFORE, BE IT ORDAINED that the Amended Agreement be approved and that the Mayor and Recorder are hereby authorized and directed to execute and deliver the same.

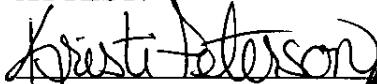
PASSED AND APPROVED by the Council of Herriman, Utah, this 18th day of December 2008.

HERRIMAN



Mayor J. Lynn Crane

ATTEST:


Kristi Peterson, CMC
City Recorder

(00054930.DOC /)



VOTING:

J. Lynn Crane	X Yea	___ Nay
Michelle Facer-Baguley	X Yea	___ Nay
Jerry Walker	X Yea	___ Nay
Mike Day	X Yea	___ Nay
Matt Robinson	X Yea	___ Nay

Exhibit A-1: Legal Description of Current Rosecrest Property

December 18, 2008

Parcel A

A parcel of land located in the East Half of Section 12, Township 4 South, Range 2 West, Salt Lake Base and Meridian, Salt Lake County, Utah, described as follows:

BEGINNING at the East Quarter Corner of Section 12, Township 4 South, Range 2 West, Salt Lake Base and Meridian, and thence along the east line of said Section 12 South 00°09'22" East 19.75 feet to the northerly right-of-way line of Mount Ogden Peak Drive as it is depicted on the official plat of Rosecrest Plat Q, a subdivision recorded April 12, 2005 as Entry No. 9346496 in Book 2005P at Page 100 of the Salt Lake County records; thence along said northerly line the following five courses: 1) South 83°06'24" West 25.68 feet to a point of tangency of a 2,270.00 foot radius curve to the right, 2) Westerly 56.14 feet along said curve through a central angle of 01°25'01" and a long chord of South 83°48'55" West 56.14 feet to a point of compound curvature of a 25.00 foot radius curve to the right, 3) Northwesterly 38.77 feet along said curve through a central angle of 88°50'39" and a long chord of North 51°03'15" West 35.00 feet, 4) North 06°37'55" West 4.92 feet and 5) South 83°22'05" West 60.00 feet; thence North 06°37'55" West 49.04 feet to a point of tangency of a 970.00 foot radius curve to the left; thence Northerly 204.04 feet along said curve through a central angle of 12°03'07" and a long chord of North 12°39'29" West 203.66 feet; thence North 85°32'20" West 501.58 feet to the east line of Lot 3, Rosecrest Plat M, a subdivision recorded June 10, 2004 as Entry No. 9086092 in Book 2004P at Page 152 of said records; thence along the east and north lines of said Lot 3 the following two courses: 1) North 14°46'19" East 189.23 feet and 2) North 75°13'41" West 526.94 feet to the east right-of-way line of Juniper Crest Road, also depicted on said Plat M, and a point on the arc of a 1,558.00 foot radius non-tangent curve to the left, the center of which bears North 86°32'30" West; thence along said east line the following two courses: 1) Northerly 469.44 feet along said curve through a central angle of 17°15'49" and a long chord of North 05°10'24" West 467.66 feet and 2) North 13°48'19" West 181.28 feet to the southerly line of Tract B of said Plat M; thence along said southerly line North 33°55'28" East 44.40 feet to the south right-of-way line of Rosecrest Road, as it is depicted on the official plat of Rosecrest Plat I, a subdivision recorded June 26, 2002 as Entry No. 8275227 in Book 2002P at Page 160 of said records, and a point on the arc of a 955.00 foot radius non-tangent curve to the right, the center of which bears South 08°20'46" East; thence along said south line the following eight courses: 1) Easterly 195.51 feet along said curve through a central angle of 11°43'47" and a long chord of North 87°31'07" East 195.17 feet, 2) South 86°36'59" East 256.58 feet to a point of tangency of a 1,255.00 foot radius curve to the right, 3) Easterly 539.54 feet along said curve through a central angle of 24°37'56" and a long chord of South 74°18'01" East 535.40 feet to a point of compound curvature of a 25.00 foot radius curve to the right, 4) Southerly 40.29 feet along said curve through a central angle of 92°19'47" and a long chord of South 15°49'10" East 36.07 feet, 5) South 59°39'17" East 50.00 feet to a point on the arc of a 25.00 foot radius non-tangent curve to the right, the center of which bears South 59°39'17" East, 6) Easterly 40.29 feet along

said curve through a central angle of 92°19'47" and a long chord of North 76°30'37" East 36.07 feet to a point of compound curvature of a 1,255.00 foot radius curve to the right, 7) Southeasterly 154.72 feet along said curve through a central angle of 07°03'49" and a long chord of South 53°47'35" East 154.62 feet and 8) South 50°15'40" East 77.31 feet to said east line of Section 12; thence South 00°07'48" East 929.60 feet to the POINT OF BEGINNING. Said parcel contains 1,039,804 square feet or 23.87 acres, more or less.

Parcel B

A parcel of land located in the Southeast Quarter of Section 12, Township 4 South, Range 2 West, Salt Lake Base and Meridian, Salt Lake County, Utah, described as follows:

BEGINNING at a point on the northerly right-of-way line of Juniper Crest Drive as it is depicted on the official plat of Rosecrest Plat T, a subdivision recorded November 03, 2006 as Entry No. 9898750 in Book 2006P at Page 327 of the Salt Lake County records, said point being North 00°09'22" West 116.01 feet along the east line of Section 12, Township 4 South, Range 2 West, Salt Lake Base and Meridian from the Southeast Corner of said Section 12, and thence along said northerly line the following five courses: 1) North 89°25'08" West 350.33 feet to a point of tangency of a 937.00 foot radius curve to the right, 2) Westerly 390.21 feet along said curve through a central angle of 23°51'39" and a long chord of North 77°29'19" West 387.40 feet, 3) North 65°33'29" West 7.45 feet to a point of tangency of a 937.00 foot radius curve to the right, 4) Northwesterly 689.37 feet along said curve through a central angle of 42°09'13" and a long chord of North 44°28'53" West 673.93 feet and 5) North 23°24'17" West 444.75 feet to the southerly line of Rosecrest Plat Q, a subdivision recorded April 12, 2005 as Entry No. 9346496 in Book 2005P at Page 100 of said records; thence along said southerly line the following four courses: 1) North 51°19'56" East 358.32 feet, 2) North 61°14'11" East 386.74 feet, 3) North 82°50'09" East 463.58 feet and 4) North 84°16'15" East 302.90 feet to said east line of Section 12; thence South 00°09'22" East 1,477.59 feet to the POINT OF BEGINNING. Said parcel contains 1,562,932 square feet or 35.88 acres, more or less

Parcel C

A parcel of land located in the Southeast Quarter of Section 12 and the Northeast Quarter of Section 13, Township 4 South, Range 2 West, Salt Lake Base and Meridian, Salt Lake County, Utah, described as follows:

BEGINNING the Northeast Corner of Section 13, Township 4 South, Range 2 West, Salt Lake Base and Meridian, and thence along the east line of said Section 13 South 00°36'54" West 1,688.92 feet to the northerly line of Rosecrest Plat R, a subdivision recorded May 19, 2006 as Entry No. 9729351 in Book 2006P at Page 143 of the Salt Lake County records; thence along said northerly line the following eight courses: 1)

South 89°59'41" West 1,118.74 feet, 2) North 00°08'39" West 387.86 feet, 3) North 08°44'16" West 570.52 feet, 4) North 58°23'47" West 561.72 feet, 5) North 45°05'53" West 278.65 feet, 6) North 13°01'15" West 360.87 feet, 7) North 30°50'33" West 152.44 feet and 8) North 04°44'43" West 85.48 feet to the southerly line of property described in that certain Special Warranty Deed recorded April 11, 2007 as Entry No. 10063117 in Book 9448 at Page 4914 of said records; thence along said southerly line the following five courses: 1) South 43°58'39" East 213.17 feet, 2) South 45°56'52" East 385.55 feet, 3) South 44°15'41" East 572.88 feet, 4) North 28°52'36" East 340.15 feet and 5) North 25°48'23" East 414.83 feet to the southerly right-of-way line of Juniper Crest Drive as depicted on the official plat of Rosecrest Plat T, a subdivision recorded November 03, 2006 as Entry No. 9898750 in Book 2006P at Page 327 of said records, said point also being on the arc of a 1,053.00 foot radius non-tangent curve to the left, the center of which bears North 31°25'54" East; thence along said southerly line the following four courses: 1) Southeasterly 128.46 feet along said curve through a central angle of 06°59'23" and a long chord of South 62°03'48" East 128.38 feet, 2) South 65°33'29" East 7.45 feet to a point of tangency of a 1,053.00 foot radius curve to the left, 3) Easterly 438.52 feet along said curve through a central angle of 23°51'39" and a long chord of South 77°29'19" East 435.36 feet to the north line of said Section 13 and 4) South 89°25'08" East 351.82 feet to the POINT OF BEGINNING. Said parcel contains 2,225,825 square feet or 51.10 acres, more or less.

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FINAL 12/18/08

WHEN RECORDED, RETURN TO:

**DONALD E. WALLACE
4393 RIVERBOAT RD SUITE 450
SALT LAKE CITY UT 84123**

**AMENDED AND RESTATED MASTER DEVELOPMENT AGREEMENT
FOR THE
ROSECREST MASTER PLANNED COMMUNITY**

THIS AMENDED MASTER DEVELOPMENT AGREEMENT is made and entered as of the 18TH day of December, 2008, by and between the City of Herriman, a Utah municipal corporation, and South Farm, L.L.C., a Utah limited liability company, and Rosecrest, Inc., a Utah corporation.

RECITALS

A. The capitalized terms used in these Recitals are defined in Section 1.2, below.

B. The City and Master Developer previously entered into the Original Master Development Agreement, dated June 26, 2000, to develop the Current Rosecrest Property which was then approximately One Thousand Forty (1,040) acres of land owned or controlled by Master Developer within the City's boundaries. Since the date of the Original Master Development Agreement, Master Developer has successfully developed a significant portion of the Current Rosecrest Property as a planned unit development known as Rosecrest.

C. In conjunction with the approval of Original Master Development Agreement, the

City approved and adopted The Community of Rosecrest Specific Plan for the Current Rosecrest Property on July 22, 1999. The Plan stipulated that the Current Rosecrest Property could be developed in a mixed use manner for residential and commercial uses, including but not limited to retail, office, hotel, business parks and other uses such as recreational parks, trails, schools, community center(s), open space, churches, and other uses as might be approved by the City.

D. The Plan was general and schematic in nature and was subject to refinement based on more precise engineering studies and other factors. Subsequent to the adoption of the Plan the City and Master Developer, on several occasions, have modified the Plan to reflect changing circumstances and market conditions.

E. The Original Master Development Agreement acknowledged in Paragraph 2 that Master Developer owned or controlled certain New Rosecrest Property that was then situated in the City of Bluffdale, Utah, and provided that, if the New Rosecrest Property became part of the City, it too would be subject to the Original Master Development Agreement.

F. The New Rosecrest Property and other properties were lawfully disconnected from Bluffdale and, as of January 1, 2008, the New Rosecrest Property was annexed into and became a part of the City.

G. As a part of the annexation of New Rosecrest Property, the City zoned the New Rosecrest Property as specified on the Zoning Map.

H. On April 3, 2008 the City approved a General Plan for the Annexed Property.

I. Master Developer and the City desire that New Rosecrest Property be developed in

a unified and consistent fashion pursuant to the General Plan and the Approved PUD.

J. Provision of infrastructure to the New Rosecrest Property is vital and, therefore, Master Developer has prepared the Infrastructure Plan.

K. Development of the New Rosecrest Property will include the Intended Uses specified in the General Plan and the Approved PUD.

L. Development of the Project as a master planned community pursuant to this Amended MDA is acknowledged by the parties to be consistent with the Act, and the Zoning Ordinance and to operate to the benefit of the City, Master Developer, and the general public.

M. The City Council has reviewed this Amended MDA and determined that it is consistent with the Act, the Zoning Ordinance and the Zoning of the New Rosecrest Property.

N. The parties acknowledge that development of the New Rosecrest Property pursuant to this Amended MDA will result in significant planning and economic benefits to the City and its residents by, among other things requiring orderly development of the New Rosecrest Property as a master planned community and increasing sales tax and other revenues to the City based on improvements to be constructed on the New Rosecrest Property.

O. Development of the New Rosecrest Property pursuant to this Amended MDA will also result in significant benefits to Master Developer by providing assurances to Master Developer that it will have the ability to develop the New Rosecrest Property and complete the development of the Current Rosecrest Property in accordance with this Amended MDA.

P. Master Developer and the City have cooperated in the preparation of this Amended MDA.

Q. The parties desire to enter into this Amended MDA to specify the rights and responsibilities of the Master Developer to develop the New Rosecrest Property and the Current Rosecrest Property as parts of the Project as expressed in this Amended MDA and the rights and responsibilities of the City to allow and regulate such development pursuant to the requirements of this Amended MDA.

R. The parties understand and intend that this Amended MDA is a “development agreement” within the meaning of, and entered into pursuant to the terms of Utah Code Ann. §10-9a-102 (2008).

NOW, THEREFORE, in consideration of the mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and Developer hereby agree to the following:

TERMS

1. **Incorporation of Recitals and Exhibits/ Definitions.**

1.1. **Incorporation.** The foregoing Recitals and Exhibits “A” – “G” are hereby incorporated into this Amended MDA.

1.2. **Definitions.** As used in this Amended MDA, the words and phrases specified below shall have the following meanings:

1.2.1. **Act** means the Municipal Land Use, Development, and Management Act, Utah Code Ann. §§10-9a-101, et seq. (2008).

1.2.2. **Administrative Action** means and includes any amendment to the Exhibits to this Amended MDA or other action that may be approved by the Administrator as provided in Section 20.

1.2.3. **Administrator** means the person designated by the City as the Administrator of this Amended MDA.

1.2.4. **Amended MDA** means this Amended and Restated Master Development Agreement including all of its Exhibits.

1.2.5. **Annexed Property** means all of the approximately 4,000 acres annexed into the City on January 1, 2008 after being disconnected from Bluffdale including the New Rosecrest Property.

1.2.6. **Applicant** means a person or entity submitting a Development Application, a Modification Application or a request for an Administrative Action.

1.2.7. **Approved PUD** means the plan for a Planned Use Development under the City's Vested Laws approved for the New Rosecrest Property on August 14, 2008 a copy of which is attached as Exhibit "C".

1.2.8. **Assessment Area** means an area or areas to be created by the City pursuant to Utah Code Ann. § 11-42-101, et seq. (2008), or other applicable State Law, with the approval of Master Developer and other property owners, to fund the construction of some or all of the Backbone Improvements.

1.2.9. **Average Density** means 4.0 Residential Dwelling Units per acre.

1.2.10. **Backbone Improvements** means those improvements shown as such in the Infrastructure Plan and which are, generally, infrastructure improvements of a comprehensive scale that are a part of the overall development of the Annexed Property and not merely a part of the development of any particular Subdivision or Commercial Site Plan. Backbone Improvements are generally considered to be in the nature of “System Improvements,” as defined in Utah Code Ann. § 11-36-101, et seq. (2008).

1.2.11. **Building Permit** means a permit issued by the City to allow construction, erection or structural alteration of any building, structure, private or public infrastructure, On-Site Infrastructure on any portion of the Project, or to construct any Off-Site Infrastructure.

1.2.12. **Buildout** means the completion of all of the development on all of the Project.

1.2.13. **CC&R’s** means the Conditions, Covenants and Restrictions regarding certain aspects of design and construction on the New Rosecrest Property to be recorded in the chain of title on the New Rosecrest Property.

1.2.14. **Capital Facilities Plan** means a plan to be adopted by the City in the future to substantiate the collection of Impact Fees as required by State law.

1.2.15. **City** means the City of Herriman, a Utah municipal corporation.

1.2.16. **City Consultants** means those outside consultants employed by the City in various specialized disciplines such as traffic, hydrology or drainage for reviewing certain aspects of the development of the Project.

1.2.17. **City's Future Laws** means the ordinances, policies, standards, procedures and processing fee schedules of the City which may be in effect as of a particular time in the future when a Development Application is submitted for a part of the Project and which may or may not be applicable to the Development Application depending upon the provisions of this Amended MDA.

1.2.18. **City's Vested Laws** means the ordinances, policies, standards and procedures of the City related to zoning, subdivisions, development, public improvements and other similar or related matters that were in effect as of the date of this Amended MDA, a digital copy of which is attached as Exhibit "D".

1.2.19. **Commercial Site Plan** means the plan submitted to the City for the approval of the development of a portion of the Project which may

include multiple buildings that are not intended to be on individual subdivision lots and includes apartments, shopping centers or similar multi-building developments or plans for other developments on the Project which are allowed by the applicable Zone as a conditional use.

1.2.20. **Council** means the elected City Council of the City.

1.2.21. **Current Rosecrest Property** means those portions (as more fully described in Exhibit A-1) of approximately 1,040 acres of land that were the subject of the Original Master Development Agreement plus approximately 94 acres of land that were later added thereto that have not, as of the date of this Amended MDA, yet been platted.

1.2.22. **Default** means a material breach of this Amended MDA.

1.2.23. **Denied** means a formal denial issued by the final decision-making body of the City for a particular type of Development Application but does not include review comments or “redlines” by City staff.

1.2.24. **Density** means the number of Residential Dwelling Units allowed per acre.

1.2.25. **Development Application** means an application to the City for development of a portion of the Project including a Subdivision, a Commercial Site Plan, a Building Permit or any other permit, certificate

or other authorization from the City required for development of the Project.

1.2.26. **Development Report** means a report containing the information specified in Sections 4.4 and/or 4.5 submitted to the City by Master Developer for the development by Master Developer of any Parcel or for the sale of any Parcel to a Subdeveloper or the submittal of a Development Application by a Subdeveloper pursuant to an assignment from Master Developer.

1.2.27. **Final Plat** means the recordable map or other graphical representation of land prepared in accordance with Utah Code Ann. § 10-9a-603, and approved by the City, effectuating a Subdivision of any portion of the Project.

1.2.28. **General Plan** means Exhibit “B”, a plan approved by the City on April 3, 2008, that sets forth general guidelines for the proposed future development of the Annexed Property.

1.2.29. **Homeowner Association(s) (or “HOA(s)”)** means one or more associations formed pursuant to Utah law to perform the functions of an association of property owners.

1.2.30. **Impact Fees** means those fees, assessments, exactions or payments of money imposed by the City as a condition on development activity as specified in Utah Code Ann. §§ 11-36-101, et seq., (2008).

1.2.31.**Infrastructure Plan** means Exhibit “E”, the plan adopted simultaneously with this Amended MDA showing the Backbone Infrastructure for the New Rosecrest Property for culinary water, secondary water, storm water, sanitary sewer and roads.

1.2.32.**Intended Uses** means the use of all or portions of the Project for single-family and multi-family residential units, hotels, restaurants, public facilities, businesses, commercial areas, professional and other offices, services, golf courses, open spaces, parks, trails and other uses as more fully specified in the, Zoning Ordinance, Approved PUD, Technical Guidelines and as shown on the General Plan.

1.2.33.**Local Park** means a park that is planned and designed as an amenity to serve and necessary for the use and convenience of a particular Subdivision or Commercial Site Plan (or a group of related Subdivisions or Commercial Site Plans) and which is not a System Improvement.

1.2.34.**Master Developer** means South Farm, L.L.C., a Utah limited liability company and/or Rosecrest, Inc., a Utah corporation, and their respective assignees or transferees as permitted by this Amended MDA.

1.2.35.**Maximum Residential Units** means the development on the New Rosecrest Property of Four Thousand Seven Hundred Nineteen

(4,719) Residential Dwelling Units and, on the Current Rosecrest Property, of Five Hundred Sixty Four (564) Residential Dwelling Units.

1.2.36. **Modification Application** means an application to amend this Amended MDA (but not including those changes which may be made by Administrative Action).

1.2.37. **Mountain View Corridor** means a “freeway” type transportation corridor proposed by the Utah Department of Transportation that bisects the New Rosecrest Property in a general northwest/southeast axis.

1.2.38. **New Rosecrest Property** means the approximately Eleven Hundred Sixty Acres (1,160) either owned or controlled by Master Developer which are a part of Annexed Property and which are more fully described in Exhibit “A”.

1.2.39. **Non-City Agency** means a governmental or quasi-governmental entity, other than those of the City, which has jurisdiction over the approval of any aspect of the Project.

1.2.40. **Notice** means any notice to or from any party to this Amended MDA that is either required or permitted to be given to another party.

1.2.41. **Off-Site Infrastructure** means those items of public or private infrastructure specified in the Infrastructure Plan necessary for development of the New Rosecrest Property such as roads and utilities

that are not on the site of any portion of the New Rosecrest Property that is the subject of a Development Application.

1.2.42. **On-Site Infrastructure** means those items of public or private infrastructure specified in the Infrastructure Plan or as a condition of the approval of a Development Application that are necessary for development of the New Rosecrest Property such as roads or utilities and that are located on that portion of the New Rosecrest Property which is subject to a Development Application.

1.2.43. **Open Space** means those areas: without any buildings or other physical improvements except those customary and/or necessary to the provision of recreation; any natural space that provides appropriate breaks from building masses or which conserves or preserves natural, historic or other amenities with social or cultural values or which maintains the natural water table level or preserves wetlands; or, any other quasi-public area which the City determines to be considered as Open Space as a part of the approval of a Development Application. Open Space includes, but is not limited to, those areas identified as Open Space in the General Plan and/or the Approved PUD.

1.2.44. **Outsourc[e][ing]** means the process of the City contracting with City Consultants or paying overtime to City employees to provide technical support in the review and approval of the various aspects of a

Development Application as is more fully set out in this Amended MDA.

1.2.45. **Parcel** means an area identified on the General Plan (or, for the Current Rosecrest Property, on the Plan) for development of a particular type of Intended Use that is not an individually developable lot.

1.2.46. **Phase** means the development of a portion of the Project at a point in a logical sequence as determined by Master Developer.

1.2.47. **Plan** means The Community of Rosecrest Specific Plan, dated July 22, 1999 previously approved by the City and governing the development of the Current Rosecrest Property.

1.2.48. **Planning Commission** means the City's Planning and Zoning Commission established by the Ordinance.

1.2.49. **Project** means the development to be constructed on the New Rosecrest Property and the Current Rosecrest Property pursuant to this Amended MDA with the associated public and private facilities, Intended Uses, Densities, Phases and all of the other aspects approved as part of this Amended MDA including its Exhibits and, for the Current Rosecrest Property, the Plan.

1.2.50. **Regional Park** means a park identified in the City's Capital Facilities Plan, Infrastructure Plan, Approved PUD or General Plan and

that is intended to provide services to the community at large such that it would be considered to be a System Improvement.

1.2.51. **Residential Dwelling Unit** means, for purposes of calculating Density, a unit intended to be occupied for residential living purposes; one single-family residential dwelling and each separate unit in a multi-family dwelling, apartment building, condominium or time-share equals one Residential Dwelling Unit.

1.2.52. **Site Plan** means the plan submitted to the City for the first stage of the approval of a Subdivision or Commercial Development.

1.2.53. **Subdeveloper** means an entity not “related” (as defined by Internal Revenue Service regulations) to Master Developer which purchases a Parcel for development.

1.2.54. **Subdivision** means the division of any portion of the Project into a subdivision pursuant to State Law and/or the Zoning Ordinance.

1.2.55. **Subdivision Application** means the application to create a Subdivision.

1.2.56. **Subdivision Site Plan** means the plan submitted with a Subdivision Application.

1.2.57. **Substantial Completion** means a point in the progress of a construction project where the work has reached the point that it is sufficiently complete such that any remaining work will not interfere

with the intended use or occupancy of the project. For work to be substantially complete it is not required that the work be 100% complete.

1.2.58.**System Improvement** means those elements of infrastructure that are defined as System Improvements pursuant to Utah Code Ann. §11-36-102(16) (2008).

1.2.59.**Technical Guidelines** means Exhibit “F” which are a set of guidelines approved by the City as a part of the approval of this Amended MDA controlling certain aspects of the design and construction of the development of New Rosecrest Property including setbacks, building sizes, open space, height limitations, parking and signage; and, the design and construction standards for buildings, roadways and infrastructure.

1.2.60.**Zone** means the City’s zoning district for any Parcel as specified on the Zoning Map.

1.2.61.**Zoning Map** means Exhibit “G” which is a map of the Zones of the New Rosecrest Property and the Current Rosecrest Property.

1.2.62.**Zoning Ordinance** means the City’s Land Use and Development Ordinance adopted pursuant to the Act that was in effect as of the date of this Amended MDA as a part of the City’s Vested Laws.

2. **Effect of this Amended MDA.** This Amended MDA shall supersede and novate the Original Master Development Agreement for the Current Rosecrest Property and shall be the sole agreement between the parties related to the Current Rosecrest Property and the New Rosecrest Property.

3. **Development of the Project.** Development of the Project shall be in accordance with the City's Vested Laws, the City's Future Laws (to the extent that these applicable as otherwise specified in this Amended MDA), the Approved PUD, this Amended MDA and its Exhibits. The City acknowledges that the Approved PUD satisfies any requirements under the Zoning Ordinance for a concept plan for the development of the New Rosecrest Property, the Current Rosecrest Property and the Project. The Approved PUD shall be valid and binding upon the parties throughout the term of this Amended MDA.

4. **Development of the New Rosecrest Property in Compliance with the General Plan and the Current Rosecrest Property in Compliance with the Plan.**

4.1. **Project Maximum Density.** At Buildout of the Project, Master Developer shall be entitled to have developed the Maximum Residential Units and to have developed the other Intended Uses as specified in the General Plan and the Approved PUD for the New Rosecrest Property, the Plan for the Current Rosecrest Property as well as the PUD approval for the Current Rosecrest Property.

4.2. **Parcels Intended Uses and Densities.** Intended Uses and Densities for each Parcel are shown on the General Plan and the Approved PUD for the

New Rosecrest Property and on the Plan for the Current Rosecrest Property.

4.3. **Use of Density.** Master Developer may use any of the Maximum Residential Units in the development of any Subdivision (or any approved Commercial Site Plan allowing for residential uses) so long as the density requested in the proposed Development Application is no greater than the maximum density allowed for the proposed Subdivision or Commercial Site Plan by the Zone, the Approved PUD and the provisions of the PUD ordinance in the City's Vested Laws regarding the clustering of such density.

4.3.1. Density Transfer Provisions of Section 4.3 are intended to measure density by considering the entire acreage of property with the same zoning. For example, even though a particular acre may have R-2-10 zoning with a density of 8.7 residential dwelling units the actual number of units that may be constructed on that particular acre may exceed 8.7 units so long as the density of the entire property carrying R-2-10 zoning does not exceed 8.7 units per acre. Further, apartments, condominiums, townhomes and other multi-family buildings are allowed as conditional uses under the PUD Chapter of the Zoning Ordinance with an underlying R-2-10 base zone and are considered by the City using the standards of the RM zone including height limitations and other design standards.

4.4. Accounting for Density for Parcels Developed by Master Developer.

At the recordation of a Final Plat, Commercial Site Plan allowing for residential uses or other approved and recorded instrument for any Parcel(s) developed by Master Developer, Master Developer shall provide the City a Development Report showing any Density used with the Parcel(s) and the Density remaining with Master Developer and for the remaining Project.

4.5. Accounting for Density for Parcels Sold to Subdevelopers. Any

Parcel sold by Master Developer to a Subdeveloper shall include the transfer of a specified portion of the Maximum Residential Units and, for any non-residential use, shall specify the amount and type of any such other use sold with the Parcel. At the recordation of a Final Plat or other document of conveyance for any Parcel sold to a Subdeveloper, Master Developer shall provide the City a Sub-Development Report showing the ownership of the Parcel(s) sold, the portion of the Maximum Residential Units and/or other type of use transferred with the Parcel(s), the amount of the Maximum Residential Units remaining with Master Developer and any material effects of the sale on the General Plan.

4.5.1. Return of Unused Density. If any portion of the Maximum Residential Units transferred to a Subdeveloper are unused by the Subdeveloper at the time the Parcels transferred with such Density receives approval for a Development Application for the final portion

of such transferred Parcels, the unused portion of the transferred Maximum Residential Units shall automatically revert back to Master Developer and the Master Developer shall file with the City a Development Report.

4.6. **Parcel Sales.** The City acknowledges that the precise location and details of the public improvements, lot layout and design and any other similar item regarding the development of a particular Parcel may not be known at the time of the sale of a Parcel. The City acknowledges that Master Developer may seek and obtain approval for the subdivision of a portion of the Project into a Parcel without providing such detailed development information subject to the specific "Parcel Sales" provisions of the Section 6.14.

5. **Zoning and Vested Rights.**

5.1. **Current Zoning.** The Project is currently zoned as specified in the Zoning Map.

5.2. **Vested Rights Granted by Approval of this Amended MDA.** To the maximum extent permissible under the laws of Utah and the United States and at equity, the City and Master Developer intend that this Amended MDA grants Master Developer all rights to develop the Project in fulfillment of this Amended MDA and the Approved PUD without modification or interference by the City except as specifically provided herein. The Parties intend that the rights granted to Master Developer under this Amended MDA and the

Approved PUD are contractual and also those rights that exist under statute, common law and at equity. The parties specifically intend that this Amended MDA and the Approved PUD grants to Master Developer “vested rights” as that term is construed in Utah’s common law and pursuant to Utah Code Ann. §10-9a-509 (2008).

5.2.1. Invalidity. Developer covenants not to bring suit to have any of the City’s Vested Laws declared to be unlawful, unconstitutional or otherwise unenforceable. If any of the City’s Vested Laws are declared to be unlawful, unconstitutional or otherwise unenforceable then Developer will, nonetheless comply with the terms of this Amended MDA. Developer shall also in that event cooperate with the City in adopting and agreeing to comply with a new enactment by the City which is materially similar to any such stricken provisions and which implements the intent of the parties in that regard as manifested by this Amended MDA.

5.2.2. Exceptions. The restrictions on the applicability of the City’s Future Laws to the Project as specified in Section 5.2 are subject to only the following exceptions:

5.2.2.1. *Master Developer Agreement.* City’s Future Laws that Master Developer agrees in writing to the application thereof to the Project;

5.2.2.2. *Compliance with State and Federal Laws.* City's Future Laws which are generally applicable to all properties in the City and which are required to comply with State and Federal laws and regulations affecting the Project;

5.2.2.3. *Safety Code Updates.* City's Future Laws that are updates or amendments to existing building, plumbing, mechanical, electrical, dangerous buildings, drainage, or similar construction or safety related codes, such as the International Building Code, the APWA Specifications, AAHSTO Standards, the Manual of Uniform Traffic Control Devices or similar standards that are generated by a nationally or statewide recognized construction/safety organization, or by the State or Federal governments and are required to meet legitimate concerns related to public health, safety or welfare; or,

5.2.2.4. *Taxes.* Taxes, or modifications thereto, so long as such taxes are lawfully imposed and charged uniformly by the City to all properties, applications, persons and entities similarly situated.

5.2.2.5. *Fees.* Changes to the amounts of fees (but not changes to the times provided in the City's Vested Laws for the imposition or collection of such fees) for the processing of Development Applications that are generally applicable to all development within the City (or a portion of the City as specified in the lawfully adopted

fee schedule) and which are adopted pursuant to State law.

5.2.2.6. *Countervailing, Compelling Public Interest.* Laws, rules or regulations that the City's land use authority finds, on the record, are necessary to avoid jeopardizing a compelling, countervailing public interest pursuant to Utah Code Ann. §10-9a-509(1)(a)(i) (2008).

5.2.2.7. *Impact Fees.* Impact Fees or modifications thereto which are lawfully adopted, imposed and collected.

5.3. **Term of Agreement.** The term of this Amended MDA shall be until December 31, 2039. This Amended MDA shall also terminate automatically at Buildout.

6. **Approval Processes for Development Applications.**

6.1. **Phasing.** The City acknowledges that Master Developer, assignees of Master Developer, and/or Subdevelopers who have purchased Parcels of the New Rosecrest Property may submit multiple applications from time-to-time to develop and/or construct portions of the General Plan for the Project in phases.

6.2. **Processing Under City's Vested Laws.** Approval processes for Development Applications shall be as provided in the City's Vested Laws except as otherwise provided in this Amended MDA. Development Applications shall be approved by the City if they comply with the City's Vested Laws and conform to this Amended MDA and the Approved PUD.

6.3. City's Cooperation in Processing Development Applications. The City shall cooperate reasonably in promptly and fairly processing Development Applications.

6.4. Outsourcing of Processing of Development Applications. Within fifteen (15) business days after receipt of a Development Application upon the request of either party the parties will confer and determine whether the City and/or the Master Developer or a Subdeveloper wishes the City to Outsource the review of any aspect of the Development Application to insure that it is processed on a timely basis. If either party determines that Outsourcing is appropriate then the City shall promptly estimate the reasonably anticipated differential cost of Outsourcing in the manner selected by the City in good faith consultation with the Master Developer (either overtime to City employees or the hiring of a City Consultant). If the Master Developer or a Subdeveloper notifies the City that it desires to proceed with the Outsourcing based on the City's estimate of costs then the Master Developer or Subdeveloper shall deposit in advance with the City the estimated differential cost and the City shall then promptly proceed with the Outsourced work. Upon completion of the Outsourcing services and the provision by the City of an invoice (with such reasonable supporting documentation as may be requested by Master Developer) for the actual differential cost (whether by way of paying a City Consultant or paying overtime to City employees) of

Outsourcing, Master Developer or the Subdeveloper shall, within ten (10) business days pay or receive credit (as the case may be) for any difference between the estimated differential cost deposited for the Outsourcing and the actual cost differential.

6.5. Non-City Agency Reviews. If any aspect or a portion of a Development Application is governed exclusively by a Non-City Agency an approval for these aspects does not need to be submitted by Applicant for review by any body or agency of the City. The Applicant shall timely notify the City of any such submittals and promptly provide the City with a copy of the requested submissions. The City may only grant final approval for any Development Application subject to compliance by Applicant with any conditions required for such Non-City Agency's approval.

6.6. Acceptance of Certifications Required for Development Applications. Any Development Application requiring the signature, endorsement, or certification and/or stamping by a person holding a license or professional certification required by the State of Utah in a particular discipline shall be so signed, endorsed, certified or stamped signifying that the contents of the Development Application comply with the applicable regulatory standards of the City. The Development Application shall thus generally be deemed to meet the specific standards which are the subject of the opinion or certification without further objection or required review by the City or any

other agency of the City. It is not the intent of this Section to preclude the normal process of the City's "redlining", commenting on or suggesting alternatives to the proposed designs or specifications in the Development Application. Generally, the City should endeavor to make all of its redlines, comments or suggestions at the time of the first review of the Development Application unless and changes to the Development Application raise new issues that need to be addressed.

6.7. Expert Review of Certifications Required for Development Applications. If the City, notwithstanding such a certification by Applicant's experts, subjects the Development Application to a review by City Consultants, the City shall bear the costs of such review if the City Consultants determine that the Applicant's expert certification was materially correct and that the City's requiring a review of the certification in the Development Application was unreasonable and not made in good faith. If the City Consultants determine that the City's requirement of a review was reasonable and made in good faith then payment of the reasonable and actual costs of the City Consultants' review shall be the responsibility of Applicant.

6.7.1. Selection of City Consultants for Review of Certifications Required for Development Applications. The City Consultant undertaking any review by the City required or permitted by this Amended MDA or the Ordinance shall be selected from a list generated

by the City for each such City review pursuant to a “request for proposal” process or as otherwise allowed by City ordinances or regulations. Applicant may, in its sole discretion, strike from the list of qualified proposers any of such proposed consultants so long as at least three (3) qualified proposers remain for selection. The anticipated cost and timeliness of such review may be a factor in choosing the expert.

6.8. Independent Technical Analyses for Development Applications. If the City needs technical expertise beyond the City’s internal resources to determine impacts of a Development Application such as for structures, bridges, water tanks, “threatened and endangered species” and other similar matters which are not required by the City’s Vested Laws to be certified by such experts as part of a Development Application, the City may engage such experts as City Consultants under the processes specified in Section 6.7.1 with the actual and reasonable costs being the responsibility of Applicant. If the City needs any other technical expertise other than as specified above, under extraordinary circumstances specified in writing by the City, the City may engage such experts as City Consultants under the processes in Section 6.7.1 with the actual and reasonable costs being the responsibility of Applicant.

6.9. City Denial of a Development Application. If the City denies a Development Application the City shall provide a written determination advising the Applicant of the reasons for denial including specifying the

reasons the City believes that the Development Application is not consistent with this Amended MDA, the Approved PUD and/or the City's Vested Laws (or, if applicable, the City's Future Laws).

6.10. Meet and Confer regarding Development Application Denials. The City and Applicant shall meet within fifteen (15) business days of any Denial to resolve the issues specified in the Denial of a Development Application.

6.11. City Denials of Development Applications Based on Denials from Non-City Agencies. If the City's denial of a Development Application is based on the denial of the Development Application by a Non-City Agency, Master Developer shall appeal any such denial through the appropriate procedures for such a decision and not through the processes specified below.

6.12. Mediation of Development Application Denials.

6.12.1. Issues Subject to Mediation. Issues resulting from the City's Denial of a Development Application that are not subject to arbitration provided in Section 6.13 shall be mediated.

6.12.2. Mediation Process. If the City and Applicant are unable to resolve a disagreement subject to mediation, the parties shall attempt within ten (10) business days to appoint a mutually acceptable mediator with knowledge of the issue in dispute. If the parties are unable to agree on a single acceptable mediator they shall each, within ten (10) business days, appoint their own representative. These two

representatives shall, between them, choose the single mediator. Applicant shall pay the fees of the chosen mediator. The chosen mediator shall within fifteen (15) business days, review the positions of the parties regarding the mediation issue and promptly attempt to mediate the issue between the parties. If the parties are unable to reach agreement, the mediator shall notify the parties in writing of the resolution that the mediator deems appropriate. The mediator's opinion shall not be binding on the parties.

6.13. Arbitration of Development Application Objections.

6.13.1. Issues Subject to Arbitration. Issues regarding the City's Denial of a Development Application that are subject to resolution by scientific or technical experts such as traffic impacts, water quality impacts, pollution impacts, etc. are subject to arbitration. The failure of a Development Application to comply with an applicable Federal, State or City Vested Law (or, if applicable, a City Future Law) is not an issue subject to arbitration.

6.13.2. Mediation Required Before Arbitration. Prior to any arbitration the parties shall first attempt mediation as specified in Section 6.12.

6.13.3. Arbitration Process. If the City and Applicant are unable to resolve an issue through mediation, the parties shall attempt within ten

(10) business days to appoint a mutually acceptable expert in the professional discipline(s) of the issue in question. If the parties are unable to agree on a single acceptable arbitrator they shall each, within ten (10) business days, appoint their own individual appropriate expert. These two experts shall, between them, choose the single arbitrator. Applicant shall pay the fees of the chosen arbitrator. The chosen arbitrator shall within fifteen (15) business days, review the positions of the parties regarding the arbitration issue and render a decision. The arbitrator shall ask the prevailing party to draft a proposed order for consideration and objection by the other side. Upon adoption by the arbitrator, and consideration of such objections, the arbitrator's decision shall be final and binding upon both parties. If the arbitrator determines as a part of the decision that the City's position was not only incorrect but was also maintained unreasonably and not in good faith then the arbitrator may order the City to pay the arbitrator's fees.

6.14. **Parcel Sales.** Master Developer may obtain approval of a Subdivision that does not create any individually developable lots in the Parcel without being subject to any requirement in the City's Vested Laws to complete or provide security for any On-Site Infrastructure or Off-Site Infrastructure at the time of such subdivision. The responsibility for completing and providing security for completion of any On-Site Infrastructure or Off-Site Infrastructure

in the Parcel shall be that of the Developer or a Subdeveloper upon a subsequent re-Subdivision of the Parcel that creates individually developable lots.

7. **Exclusion from Moratoriums.** The Project shall be excluded from any moratorium adopted pursuant to Utah Code Ann. §10-9a-504 (2008) unless such a moratorium is found on the record by the Council to be necessary to avoid jeopardizing a compelling, countervailing public interest.

8. **Application Under City's Future Laws.** Without waiving any rights granted by this Amended MDA, Master Developer may at any time, choose to submit a Development Application for some or all of the Project under the City's Future Laws in effect at the time of the Development Application. Any Development Application filed for consideration under the City's Future Laws shall be governed by all portions of the City's Future Laws related to the Development Application. The election by Master Developer at any time to submit a Development Application under the City's Future Laws shall not be construed to prevent Master Developer from relying for other Development Applications on the City's Vested Laws.

9. **Open Space and Trails Requirements.** The Development Application approval for each separate Parcel shall provide that the Applicant shall construct or designate for dedication the land required for Open Space and/or Trails as provided in the General Plan, the Approved PUD and/or the Technical Guidelines. Any such designation shall include adequate assurances to the City that the land so designated can and will be used for

the dedication and/or construction of the planned Open Space and/or Trails. The classification of a Parcel or a portion of a Subdivision or Commercial Site Plan as Open Space shall be irrespective of whether the land is owned by a private entity or by a Homeowners Association. To be counted as Open Space the land must be accessible and usable by the public except that large, private areas of land used for private golf courses, private recreational facilities or other similar uses shall be considered as Open Space even if not available to be used by the public so long as adequate assurances are made to the City, such as deed restrictions, that this type of open space shall remain with the intended uses in the future. The donation of a portion of land by Master Developer or a Subdeveloper for a church shall not be counted for Open Space required by the Approved PUD except that if any substantial fields, parks or similar green spaces are created with the church those areas may be counted as Open Space. The Open Space, Local Parks and/or Trails may be owned by a Homeowners Association or may be dedicated to the City or a third-party as specified in the General Plan and/or the Approved PUD.

9.1. **Regional Parks.** City and Master Developer anticipate that Regional Parks will need to be constructed on portions of the Annexed Property. Master Developer shall cooperate with the City in the planning, design and financing of the Regional Parks. Master Developer and the City shall negotiate in good faith for the acquisition of such property, including, but not limited to, the creation of an Assessment Area, Impact fees or dedication of the necessary property to the City in exchange for credits against Impact Fees.

9.2. Creation of Open Space, Local Parks and/or Trails. Open Space, Local Parks and/or Trails shall generally be created and/or dedicated by means of a Subdivision or a Commercial Site Plan to which the Open Space, Local Parks and/or Trails are either internal or contiguous. The parties intend that the creation of Open Space, Local Parks and/or Trails will generally maintain a pro rata relationship between the amount of land being developed with a Development Application and the total acreage designated for Open Space, Local Parks and/or Trails as established in the Approved PUD. The City acknowledges, however, that it may not be in the interest of either the City, Master Developer, assignees of Master Developer or Subdevelopers to always dedicate Open Space and/or Trails on such a contiguous basis which may result in constructing and/or designating incremental, small, unusable parcels of land. Therefore, each Development Application approval shall provide for the designation for dedication and/or construction of Open Space, Local Parks and/or Trails in such amounts as are determined to be appropriate considering the factors specified below. Any Denial by the City based on the amount of Open Space, Local Parks and/or Trails to be constructed and/or designated for dedication shall be subject to the mediation and arbitration provisions of Sections 6.12 and 6.13. The factors to be evaluated are:

9.2.1. Amounts and Types Previously Developed. The amounts and types of Open Space, Local Parks and/or Trails provided on the portions of the Project previously developed;

9.2.2. Amounts and Types Remaining to be Developed. The amounts and types of Open Space, Local Parks and/or Trails remaining to be designated and/or constructed pursuant to the General Plan, and the Approved PUD; and

9.2.3. Nature of Proposed Uses. The amount and nature of the land and the types land uses proposed by the Development Application.

9.3. **Notice to the City.** Upon the initial filing of any Development Application in which Open Space, Local Parks and/or Trails are located, Master Developer shall provide Notice to the City of its intent to dedicate the proposed parcels of Open Space, Local Parks and/or Trails as a part of the final recorded instrument approving the Development Application. Within sixty (60) days of receipt of the Notice, the City shall make an initial determination whether the City intends to accept dedication of the Open Space, Local Parks or Trails. If the City does not intend to accept dedication of the Open Space, Local Parks or Trails the City shall notify Applicant of its decision. The City's notification that it does not intend to accept dedication of the Open Space, Local Parks and/or Trails shall constitute a waiver of its right to receive an outright conveyance of fee title to that parcel. If the City does not exercise this

option for any reason, such Open Space, Local Parks and/or Trails shall be offered to Salt Lake County, a conservation organization, a Homeowners Association or another similar designated entity reasonably acceptable to the City.

9.4. Dedication of Open Space, Local Parks or Trails. Dedication of the Open Space, Local Parks and/or Trails to the City shall be by plat recordation or by dedication by deed from Master Developer or a Subdeveloper which shall be without any financial encumbrance or other encumbrance (including easements) which unreasonably interferes with the use of the property for Open Space, Local Parks and/or Trails.

9.5. Relationship Between Development and Construction of Open Space, Local Parks and Trails. Unless otherwise agreed to in writing, construction of any Local Park which is part of or contiguous to any Subdivision or Commercial Site Plan shall be substantially completed prior to issuance of one-half of the Building Permits for the Subdivision or completion of one-half of the improvements for the Commercial Site. This requirement for substantial completion shall not apply to any elements of the Local Park and/or Trails the completion of which are weather dependent (e.g., landscaping that cannot be installed in winter). These weather dependent items shall be installed and substantially completed as soon as practicable in the next

appropriate season. If they are not so completed then no further building permits shall be issued until they are substantially completed.

9.6. Maintenance of Open Space, Local Parks and Trails. Upon acceptance by the City of the proffered Open Space, Local Parks and/or Trails and after formal possession, the City shall be responsible for maintaining the Open Space, Local Parks and/or Trails after final inspection and acceptance of the improvements to the Open Space, Local Parks and/or Trails, if any. If the Open Space, Local Parks and/or Trails are dedicated to an entity other than the City then the dedication shall provide for the maintaining the Open Space Local Parks and/or Trails in a manner to be reasonably acceptable to the City.

9.7. Out-of-Sequence Dedication of Open Space, Local Parks and/or Trails. As a part of the consideration of any Development Application the City may request a dedication and/or a conservation easement of Open Space, Local Parks and/or Trails designated in the General Plan and the Approved PUD not associated with that Development Application. Master Developer or a Subdeveloper shall grant the request if the requested Open Space, Local Parks and/or Trails requested for out-of-phase dedication do not create significant costs or undue financial expense to Master Developer or Subdeveloper that would not normally be incurred with the Development Application.

9.8. Donation or Sale for Public/Quasi-Public Purposes. If Master Developer donates Open Space, Local Parks, Trails, Regional Parks or any property not developed by Master Developer to the City to be used by the public or for a quasi-public use to include but not limited to such uses as parks, recreational facilities, libraries or schools or donates any property for any church, Master Developer shall not lose any Residential Units from the Maximum Residential Units. Instead, the Residential Units that were planned to be developed on the donated property may be used in any other portion of the Project but shall not alter the maximum number of units to be allowed under the Approved PUD in any individual Subdivision. If Master Developer sells or conveys such property for financial gain (other than for tax benefits), the Maximum Residential Units shall be reduced by a number calculated by multiplying the acreage of the property sold or conveyed for financial remuneration (other than for tax benefits) times the Average Density.

9.9. Special Provisions Regarding the Mountain View Corridor.

9.9.1. Preferred Alignment. The City and Master Developer acknowledge that there is a proposal by the Wasatch Front Regional Council and the State of Utah and other public agencies for the development of a major highway currently known as the Mountain View Corridor in the western part of Salt Lake County passing through the New Rosecrest Property. The parties acknowledge that the

proposed alignment has not yet been finalized. The City and Master Developer both currently prefer the alignment of the Mountain View Corridor shown in Exhibit "C" and shall each use their reasonable efforts to cause this alignment to be adopted. The parties acknowledge that the New Rosecrest Property set aside for the Mountain View Corridor in Exhibit "C" is Zoned the same as the land adjacent to the Mountain View Corridor.

9.9.2. Current Plan. The parties acknowledge that Master Developer is currently working on a plan with the Utah Department of Transportation ("UDOT") regarding the Mountain View Corridor. That plan involves Master Developer selling the land needed for the Mountain View Corridor to UDOT with a provision that if UDOT constructs the Mountain View Corridor within a certain period of time then Master Developer will repay UDOT the amount that Master Developer was paid for the land for the Mountain View Corridor. If that plan is implemented then, during any period for which Master Developer has not repaid UDOT as provided above then Master Developer shall lose from the Maximum Residential Units a number of Residential Dwelling Units equal to the acres sold to UDOT multiplied by the Average Density. If, pursuant to the plan, Master Developer ultimately donates part or all of the land for the Mountain View

Corridor to UDOT by repaying part or all of the monies paid in advance by UDOT then Master Developer shall recover the lost Residential Dwelling Units on a pro rata basis upon the repayment to UDOT (e.g., if Master Developer repays 50% of the monies paid by UDOT then Master Developer shall be entitled to a return of 50% of the lost Residential Dwelling Units).

9.9.3. Other Dedication or Sale. If the currently contemplated plan is not effectuated then if Master Developer donates part or all of the land for the Mountain View Corridor then Master Developer shall not lose any portion of the Maximum Residential Units for any acre dedicated. If Master Developer sells part or all of the land for the Mountain View Corridor then the Maximum Residential Units shall be reduced by a number calculated by multiplying the acreage of the property sold or conveyed for financial remuneration (other than for tax benefits) times the Average Density.

9.10. **Tax Benefits.** The City acknowledges that Master Developer intends to seek and qualify for certain tax benefits by reason of conveying, dedicating, gifting, granting or transferring Open Space and/or Trails to the City or to a charitable organization. Master Developer shall have the sole responsibility to claim and qualify for any tax benefits sought by Master Developer by reason of the foregoing. The City shall reasonably cooperate with Master Developer

to the maximum extent allowable under law to allow Master Developer to take advantage of any such tax benefits.

10. **Public Improvements.**

10.1. **Utilities and On-Site Infrastructure.** Master Developer shall have the right and the obligation to construct or cause to be constructed and installed all portions of the On-Site Infrastructure and all Off-Site Infrastructure which are required by the Infrastructure Plan as a condition of approval of the Development Application. If any On-Site Infrastructure or Off-Site Infrastructure required by the Infrastructure Plan as a condition of approval of the Development Application is constructed by the City then the City shall comply with the statutory processes for such work.

10.2. **Variations between Infrastructure Plans and City's Future Capital Facilities Plan.** The parties acknowledge that the City is in the process of adopting a new Capital Facilities Plan supported by a new comprehensive plan and an Impact Fee ordinance as required by State Law for the collection of Impact Fees to pay for the construction of parts or all of the Backbone Infrastructure. This Capital Facilities Plan and any future Capital Facilities Plan may differ from the Infrastructure Plans. As a part of the approval of a Development Application the City may require the Master Developer or a Subdeveloper to build portions of the Backbone Infrastructure as shown on the Capital Facilities Plan (after it is adopted) instead of as shown on the

Infrastructure Plans. However, the Master Developer or a Subdeveloper shall not be required to build any such Backbone Infrastructure pursuant to the Capital Facilities Plans that exceeds the facilities shown on the Infrastructure Plans unless the City and the Master Developer or a Subdeveloper have executed an agreement providing for the reimbursement of the pro rata costs and the time-value-of-money (which may be included in the pricing of the improvement in the Impact Fees) for the construction of any level of Backbone Infrastructure in excess of that needed to serve the development proposed by the Development Application. If the parties cannot reach agreement on the terms of a reimbursement agreement then the terms of such a reimbursement agreement shall be subject to the mediation and arbitration provisions of Sections 6.12 and 6.13.

10.2.1.Errors in Infrastructure Plans or Variations caused by Master Developer or Subdeveloper. If any variation in the level of required Backbone Infrastructure is necessitated by an erroneous sizing by Master Developer in the creation of the Infrastructure Plans or by changes to the demand needs caused by a material change by Master Developer or a Subdeveloper in the intensity of a proposed development then the provisions of Section 10.2 above regarding the requirement for a reimbursement agreement shall not be applicable to the differences caused by Master Developer and/or a Subdeveloper.

10.3. **No Additional Off-Site Infrastructure Requirements.** The City shall not, directly or indirectly, charge the Master Developer, its affiliates or successors, Subdevelopers or the New Rosecrest Property any development fees, impact fees, water hookup fees, or any similar fees, charges, assessments or exactions for Off-Site Infrastructure for the development of the Project except as may be otherwise allowed by law.

10.4. **Financing of Backbone Infrastructure.** The parties acknowledge that the methodology for financing the construction of the Backbone Infrastructure has not yet been determined. The parties covenant to work promptly and cooperatively to determine such financing which may include, but is not limited to Impact Fees, Assessment Areas, developer financing with reimbursements or credits or some combination of these or other methods. Prior to the approval of any Development Application requiring the construction of Backbone Infrastructure (whether such Backbone Infrastructure is On-Site Infrastructure or Off-Site Infrastructure) if the City and Master Developer agree on the required elements of Backbone Infrastructure Required for the Development Application then the City and Master Developer shall execute an agreement providing for a mutually acceptable manner of financing such Backbone Improvements. If the City and Master Developer cannot agree within twenty (20) business days of the submittal of a Development Application on which elements of Backbone

Infrastructure are required for the Development Application then the City and Master Developer shall mediate and/or arbitrate such a dispute as provided in Sections 6.12 and 6.13. If the City's position determining which elements of Backbone Infrastructure are required for a Development Application is determined to be correct then Master Developer shall find a methodology acceptable to the City to either construct such Backbone Infrastructure or an alternative as a condition of the approval of the Development Application.

10.5. Provisions Regarding South Hills Boulevard.

10.5.1. General Statement. The Infrastructure Plan contemplates the construction of a road known as South Hills Boulevard running from approximately 4300 West and 14600 intersecting with Redwood Road at approximately 16200 South. The intent of the parties is that South Hills Boulevard will generally keep traffic created by the Project and other development within the Annexed Property from materially and adversely impacting residential streets in the City and in surrounding cities as well as providing connectivity for the provision of municipal services to developments in certain portions of the Annexed Property. The parties also acknowledge that these functions will also be served by the Mountain View Corridor when that is completed. Finally, the parties also acknowledge that the construction of South Hills Boulevard is a costly endeavor and will require the cooperation of the parties to

this Amended MDA and the participation of the other owners of the Annexed Property and others.

10.5.2. Cooperation on Financing. The City intends to promptly begin the process of adopting and collecting an Impact Fee to provide for, among other items of infrastructure, the fair share cost allocation of South Hills Boulevard, among other items of infrastructure, by all of the persons who will contribute to the need for South Hills Boulevard and/or the other items of infrastructure. The City will also promptly consider creating a Special Assessment Area or Areas to finance the construction of South Hills Boulevard.

10.5.3. General Timing of the Need for South Hills Boulevard. The need for South Hills Boulevard will be determined by analyzing the impact of any development proposed by a Development Application on the roads in the City and in surrounding municipalities and on the delivery of public services to the proposed development. Generally a proposed development should not be permitted to materially and adversely impact the traffic on residential streets in the City or in surrounding municipalities or materially and adversely impact the costs to the City or the convenience to the City in the delivery of public services to the proposed development due to the nature of the connection of the development to existing areas of service within the

City. The burden of establishing the impact or lack thereof of any proposed development that is subject to this section 10.5 shall be on the Master Developer or Subdeveloper.

10.5.4. Preemption by Other Connections.

10.5.4.1. *Mountain View Corridor.* If the need for South Hills Boulevard as a condition of the approval of a Development Application, as specified in Section 10.5.3, is determined to occur within three (3) years of the date that the section of the Mountain View Corridor in the City that would mitigate the need for South Hills Boulevard is reasonable projected by UDOT to be open for traffic (based on factors including, but not limited to, construction schedules and the assurance of adequate funding) then the parties acknowledge that South Hills Boulevard will not be required to be constructed as a part of the approval of that Development Application. The burden of establishing that the construction of the Mountain View Corridor will meet the provisions of this subsection shall be on the Master Developer.

10.5.4.1.1. *Mediation and Arbitration of Determination.* Any dispute about whether the timing of the completion of the Mountain View Corridor satisfies the need for South Hills Boulevard shall be

subject to the mediation and arbitration provisions of Sections 6.12 and 6.13.

10.5.4.2. *Preemption by Actual Connections to Other Major Arterials.* If the need for South Hills Boulevard, as contemplated in Section 10.5.3, is substantially mitigated by the actual physical connection of a development proposed by a Development Application to a major arterial road such as 3600 West, 4000 West, Redwood Road, Rose Crest Road, Juniper Crest Road, 14400 South, 4400 West or any other similar connection in the future that is reasonably acceptable to the City then South Hills Boulevard will not be required to be constructed as a part of the approval of a Development Application.

10.5.4.2.1. *Determination Provision.* The parties acknowledge that at some level of development the City may determine that the preemption connections provided in Section 10.5.4.2 may be insufficient. At that point the parties shall determine an additional major arterial connection to mitigate any harmful effects that Section 10.5 addresses. Any dispute between the parties regarding such additional major arterial connections shall be subject to the mediation and arbitration provisions of Sections 6.12 and 6.13.

10.5.5. Satisfaction of Need by Secured Financing of Connection. If there is determined to be a need for South Hills Boulevard, as provided in Section 10.5.3, or if an alternative major arterial is determined to be sufficient pursuant to Section 10.5.4.2 then the provision of security acceptable to the City to ensure the financing and construction of such a road (in a manner, amount and with a form and timing of completion reasonably acceptable to the City) then the actual physical construction of South Hills Boulevard will not be required as a condition of the approval of a Development Application.

10.5.6. Estimation of the Impacts. The parties acknowledge that the amount of development which will cause such adverse impacts is difficult to estimate at the time of the execution of this Amended MDA because of the uncertainty of future development patterns and other infrastructure timing and options.

10.5.6.1. *Mediation and Arbitration of Determination.* A determination by the City that a Development Application generates sufficient adverse impacts to justify making the construction of South Hills Boulevard a condition of the approval of the Development Application is subject to the mediation and arbitration provisions of Sections 6.12 and 6.13.

10.5.7. Two-lane Initial Configuration. The parties acknowledge that even if a need for South Hills Boulevard is determined to be created by the approval of a Development Application then a two-lane constructed configuration of South Hills Boulevard (on an ultimately full-sized right-of-way) should be sufficient to meet that need unless the Mountain View Corridor is delayed substantially beyond that timing which is currently contemplated.

10.6. **Construction Prior to Completion of Infrastructure.** Anything in the Zoning Ordinance notwithstanding, Master Developer may obtain building permits and/or temporary Certificates of Occupancy for model homes, homes shows, sales offices, construction trailers or similar temporary uses prior to the installation of all On-Site Infrastructure or Off-Site Infrastructure required to be eventually completed so long as such installation is secured pursuant to the City's Vested Laws.

10.6.1. Restrictions on Certificates of Occupancy. No permanent Certificate of Occupancy shall be issued by the City and no residential occupancy shall be permitted unless all On-Site Infrastructure and Off-Site Infrastructure (except for landscaping which shall be considered pursuant to Section 14.1) required pursuant to an approved Development Application are installed and Substantially Complete.

10.7. **Modifications of Infrastructure Locations.** The City acknowledges that the Zoning of certain portions of the New Rosecrest Property is influenced by the location of certain elements of the Infrastructure Plan. Changes in the precise locations of elements of the Infrastructure Plan may render the Zoning of certain portions of the New Rosecrest Property impractical (e.g. a proposed road is moved so that it leaves a portion of property with a Zoning that is no longer economically or developmentally practical). If any such changes are caused by the request of the City then the City shall initiate, at the City's cost, the process to change the Zoning of the affected property to more logically conform to the intent of the General Plan.

11. **Cable TV/Fiber Optic Service.** Subject to all applicable Federal and State laws, Master Developer may install or cause to be installed underground all conduits and cable service/fiber optic lines within the Project at no expense to the City. The conduits, cable, lines, connections and lateral connections shall remain the sole and exclusive property of Master Developer or cable/fiber optic provider even though the roadways in which the cable/fiber optic lines conduits, connections and laterals are installed may be dedicated to the City. Master Developer may contract with any cable TV/fiber optic provider of its own choice and grant an exclusive access and/or easement to such provider to furnish cable TV/fiber optic services for those dwelling units or other uses on the Project, so long as the property is private and not dedicated to the public. The City may charge and collect all taxes

and/or fees with respect to such cable service and fiber optic lines as allowed under State Law.

12. **CC&R's.** The Homeowners Association(s) will be responsible for the implementation and enforcement of the CC&R's and the Technical Guidelines. The CC&R's may be amended by the processes specified in the CC&R's without any requirement of approval of such amendments by the City. Prior to the issuance of any building permits for residential, business, commercial or recreational use but excluding infrastructure the architectural control subcommittee established by the CC&R's shall certify to the City that the proposed permit complies with the Technical Guidelines and the CC&R's.

13. **Payment of Fees.**

13.1 **General Requirement of Payment of Fees.** Master Developer and/or a Subdeveloper shall pay to the City all fees in amounts specified in the City's Future Laws (but, the timing of the imposition and collection of such fees shall be governed by the City's Vested Laws).

13.2 **Infrastructure Built by Master Developer.** Master Developer or Subdevelopers may, from time-to-time, install and construct portions of the infrastructure specified in the Infrastructure Plan which are System Improvements. The City shall ensure that Master Developer is either not charged Impact Fees for such System Improvements or that Developer otherwise receives credits, adjustments or reimbursements for such System Improvements as required by State law.

13.3 **Reimbursement for “Upsizing”.** The City shall not require Master Developer to “upsized” any public improvements other than the Backbone Infrastructure (i.e., to construct the improvements to a size larger than required to service the Project) unless financial arrangements reasonably acceptable to Master Developer are made to compensate Master Developer for the *pro rata* costs of such upsizing. Compensation to Master Developer for any “upsizing” of the Backbone Improvements shall be agreed to by Master Developer and the City as a part of the plan for financing the construction of such Backbone Improvements as specified in Section 10.4.

14. **Construction Standards and Requirements.**

14.1. **Separate Security for Landscaping.** Security for the completion of those items of landscaping that are weather dependent may be, at the option of Master Developer, by a security instrument acceptable to the City separate from the security instrument used for the other portion of the public improvements.

14.2. **Building Permits.** No buildings or other structures shall be constructed within the Project without Master Developer and/or a Subdeveloper first obtaining building permits. Master Developer and/or a Subdeveloper may apply for and obtain a grading permit following conceptual approval by the Planning Commission of a Commercial Site Plan or a Subdivision Site Plan if Master Developer and/or a Subdeveloper has submitted and received approval

of a site grading plan from the City Engineer. Any grading performed by Master Developer and/or a Subdeveloper pursuant to only a grading permit prior to the establishment of finished grades by a final approval shall be at the risk of Master Developer or the Subdeveloper meaning that if there are any changes between the grade elevations created by the grading permit activities and the final, approved elevations then such changes must be made at the sole cost and expense of Master Developer or the Subdeveloper that created the discrepancy.

14.3. City and Other Governmental Agency Permits. Before commencement of construction or development of any buildings, structures or other work or improvements upon any portion of the Project, Master Developer or a Subdeveloper shall, at its expense, secure, or cause to be secured, any and all permits which may be required by the City or any other governmental entity having jurisdiction over the work. The City shall reasonably cooperate with the Master Developer or a Subdeveloper in seeking to secure such permits from other governmental entities.

15. **On-Site Processing of Natural Materials.** Master Developer may use the natural materials located on the Project such as sand, gravel and rock, and may process such natural materials into construction materials such as aggregate or topsoil for use in the construction of infrastructure, homes or other buildings or improvements located in the Project and other locations outside the Project. Master Developer shall make an application

for all such uses pursuant to the processes for a conditional use as provided in the City's Vested Laws. Master Developer may also make an application for the production of concrete and asphalt pursuant to the processes as if it were a conditional use as provided in the City's Vested Laws. Conditional uses for all uses contemplated in this section shall terminate at Buildout or at the termination or expiration of this Amended MDA.

16. **Provision of Municipal Services.** The City shall provide all City services to the Project that it provides from time-to-time to other residents and properties within the City including, but not limited to, culinary water, police, fire and other emergency services. Such services shall be provided to the Project at the same levels of services, on the same terms and at the same rates as provided to other residents and properties in the City.

17. **Future Property Which May be Included in this Amended MDA.**

17.1. **Future Property within the Annexed Property.** If Master Developer acquires any additional property in the Annexed Property then such future property shall be automatically included within this Amended MDA at the option of Master Developer and this Amended MDA shall be recorded in the chain of title of such property. Any such future property acquired by Master Developer within the Annexed Property shall be developed pursuant to the General Plan and the Maximum Residential Units shall automatically be increased by multiplying the number of acres thereby added to this Amended MDA times the Average Density.

17.2. **Future Property not within the Annexed Property.** If Master Developer acquires any additional property that is not within the Annexed Property then such future property may be added to this Amended MDA if the City determines that the addition of such future property is appropriate in light of its proximity to the Project and the appropriateness of such a development pattern.

18. **Default.**

18.1. **Notice.** If Master Developer or a Subdeveloper or the City fails to perform their respective obligations hereunder or to comply with the terms hereof, the party believing that a Default has occurred shall provide Notice to the other party. If the City believes that the Default has been committed by a Subdeveloper then the City shall also provide a courtesy copy of the Notice to Master Developer.

18.2. **Contents of the Notice of Default.** The Notice of Default shall:

18.2.1. Claim of Default. Specify the claimed event of Default;

18.2.2. Identification of Provisions. Identify with particularity the provisions of any applicable law, rule, regulation or provision of this Amended MDA that is claimed to be in Default;

18.2.3. Specify Materiality. Identify why the Default is claimed to be material; and

18.2.4. Optional Proposed Cure. If the City chooses, in its discretion,

propose a method and time for curing the Default which shall be of no less than sixty (60) days duration.

18.3. Meet and Confer, Mediation, Arbitration. Upon the issuance of a Notice of Default the parties shall engage in the “Meet and Confer” and “Mediation” processes specified in Sections 6.10 and 6.12. If the claimed Default is subject to Arbitration as provided in Section 6.13 then the parties shall follow such processes.

18.4. Remedies. If the parties are not able to resolve the Default by “Meet and Confer” or by Mediation, and if the Default is not subject to Arbitration then the parties may have the following remedies:

18.4.1. Legal Remedies. All rights and remedies available at law and in equity, including, but not limited to, injunctive relief, specific performance and/or damages.

18.4.2. Enforcement of Security. The right to draw on any security posted or provided in connection with the Project and relating to remedying of the particular Default.

18.4.3. Withholding Further Development Approvals. The right to withhold all further reviews, approvals, licenses, building permits and/or other permits for development of the Project in the case of a default by Master Developer, or in the case of a default by a Subdeveloper, development of those Parcels owned by the

Subdeveloper until the Default has been cured.

18.5. **Public Meeting.** Before any remedy in Section 18.4.3 may be imposed by the City the party allegedly in Default shall be afforded the right to attend a public meeting before the Council and address the Council regarding the claimed Default.

18.6. **Emergency Defaults.** Anything in this Amended MDA notwithstanding, if the Council finds on the record that a default materially impairs a compelling, countervailing interest of the City and that any delays in imposing such a default would also impair a compelling, countervailing interest of the City then the City may impose the remedies of Section 18.4.3 without the requirements of Sections 18.3. The City shall give Notice to the Developer and/or any applicable Subdeveloper of any public meeting at which an emergency default is to be considered and the Developer and/or any applicable Subdeveloper shall be allowed to address the Council at that meeting regarding the claimed emergency Default

18.7. **Extended Cure Period.** If any Default cannot be reasonably cured within sixty (60) days then such cure period shall be extended so long as the defaulting party is pursuing a cure with reasonable diligence.

18.8. **Cumulative Rights.** The rights and remedies set forth herein shall be cumulative.

19. **Notices.** All notices required or permitted under this Amended Development

Agreement shall, in addition to any other means of transmission, be given in writing by certified mail and regular mail to the following address:

To the Master Developer:

South Farm, L.L.C.
Rosecrest, Inc.
Attn: Donald E. Wallace
4393 Riverboat Road, Suite 450
Salt Lake City, Utah 84123

Hollis S. Hunt, Esq.
Hunt & Rudd
392 East 12300 South, Suite A
Draper, Utah 84020

Bruce R. Baird, Esq.
Hutchings Baird Curtis & Astill P.L.L.C.
9537 South 700 East
Sandy, UT 84070

To the City:

City of Herriman
Attn: Mayor
13011 South Pioneer Street
Herriman, Utah 84096

John N. Brems, Esq.
Parsons, Davies, Kinghorn & Peters
185 South State Street #700
Salt Lake City, Utah 84111

19.1. **Effectiveness of Notice.** Except as otherwise provided in this Amended MDA, each Notice shall be effective and shall be deemed delivered on the earlier of:

19.1.1. Physical Delivery. Its actual receipt, if delivered personally, by

courier service, or by facsimile provided that a copy of the facsimile Notice is mailed or personally delivered as set forth herein on the same day and the sending party has confirmation of transmission receipt of the Notice).

19.1.2.Electronic Delivery. Its actual receipt if delivered electronically be email provided that a copy of the email is printed out in physical form and mailed or personally delivered as set forth herein on the same day and the sending party has an electronic receipt of the delivery of the Notice

19.1.3.Mail Delivery. On the day the Notice is postmarked for mailing, postage prepaid, by First Class or Certified United States Mail and actually deposited in or delivered to the United States Mail. Any party may change its address for Notice under this Amended MDA by giving written Notice to the other party in accordance with the provisions of this Section.

20. **Administrative Amendments.**

20.1. **Allowable Administrative Applications:** The following modifications to this Amended MDA may be considered and approved by the Administrator.

20.1.1.Infrastructure. Modification of the location and/or sizing of the infrastructure for the Project that does not materially change the functionality of the infrastructure.

20.1.2.Technical Guidelines. Modifications of the Technical Guidelines as permitted by the Approved PUD.

20.2. **Application to Administrator.** Applications for Administrative Amendments shall be filed with the Administrator

20.2.1.Referral by Administrator. If the Administrator determines for any reason that it would be inappropriate for the Administrator to determine any the Administrative Amendment the Administrator may require the Administrative Amendment to be processed as a Modification Application.

20.2.2.Administrator's Review of Administrative Amendment. The Administrator shall consider and decide upon the Administrative Amendment within a reasonable time.

20.2.3.Notification Regarding Administrator's Approval. If the Administrator approves any Administrative Amendment the Administrator shall notify the Council in writing of the proposed approval. Unless the Administrator receives a notice pursuant to Section 20.2.4 requiring that the proposed Administrative Amendment be considered by the City Council as a Modification Application then approval of the Administrative Amendment by the Administrator shall be conclusively deemed binding on the City.

20.2.4.City Council Requirement of Modification Application Processing. Any member of the Council may, within ten (10) business days after notification by the Administrator, notify the Administrator that the Administrative Amendment must be processed as a Modification Application.

20.2.5.Appeal of Administrator’s Denial of Administrative Amendment. If the Administrator denies any proposed Administrative Amendment the Applicant may process the proposed Administrative Amendment as a Modification Application.

21. **Amendment.** Except for Administrative Amendments, any future amendments to this Amended MDA shall be considered as Modification Applications subject to the following processes.

21.1. **Who may Submit Modification Applications.** Only the City and Master Developer or an assignee that succeeds to all of the rights and obligations of Master Developer under this Amended MDA (and not including a Subdeveloper) may submit a Modification Application.

21.2. **Modification Application Contents.** Modification Applications shall:

21.2.1.Identification of Property. Identify the property or properties affected by the Modification Application.

21.2.2.Description of Effect. Describe the effect of the Modification Application on the affected portions of the Project.

21.2.3.Identification of Non-City Agencies. Identify any Non-City agencies potentially having jurisdiction over the Modification Application.

21.2.4.Map. Provide a map of any affected property and all property within three hundred feet (300') showing the present or Intended Use and Density of all such properties.

21.2.5.Fee. Modification Applications shall be accompanied by a fee in an amount reasonably estimated by the City to cover the costs of processing the Modification Application.

21.3. City Cooperation in Processing Modification Applications. The City shall cooperate reasonably in promptly and fairly processing Modification Applications.

21.4. Planning Commission Review of Modification Applications.

21.4.1.Review. All aspects of a Modification Application required by law to be reviewed by the Planning Commission shall be considered by the Planning Commission as soon as reasonably possible in light of the nature and/or complexity of the Modification Application.

21.4.2.Recommendation. The Planning Commission's vote on the Modification Application shall be only a recommendation and shall not have any binding or evidentiary effect on the consideration of the Modification Application by the Council.

21.5. **Council Review of Modification Application.** After the Planning Commission, if required by law, has made or been deemed to have made its recommendation of the Modification Application the Council shall consider the Modification Application.

21.6. **Council's Objections to Modification Applications.** If the Council objects to the Modification Application, the Council shall provide a written determination advising the Applicant of the reasons for denial including specifying the reasons the City believes that the Modification Application is not consistent with the intent of this Amended MDA, the Approved PUD and/or the City's Vested Laws (or, if applicable, the City's Future Laws).

21.7. **Meet and Confer regarding Modification Applications.** The Council and Master Developer shall meet within fourteen (14) calendar days of any objection to resolve the issues presented by the Modification Application and any of the Council's objections.

21.8. **Mediation of Council's Objections to Modification Applications.** If the Council and Master Developer are unable to resolve a dispute regarding a Modification Application, the parties shall attempt within seven (7) days to appoint a mutually acceptable expert in land planning or such other discipline as may be appropriate. If the parties are unable to agree on a single acceptable mediator they shall each, within seven (7) days, appoint their own individual appropriate expert. These two experts shall, between them, choose the single

mediator. Master Developer shall pay the fees of the chosen mediator. The chosen mediator shall within fourteen (14) days, review the positions of the parties regarding the mediation issue and promptly attempt to mediate the issue between the parties. If the parties are unable to reach agreement, the mediator shall notify the parties in writing of the resolution that the mediator deems appropriate. The mediator's opinion shall not be binding on the parties.

22. **Estoppel Certificate.** Upon twenty (20) days prior written request by Master Developer or a Subdeveloper, the City will execute an estoppel certificate to any third party certifying that Master Developer or a Subdeveloper, as the case may be, at that time is not in default of the terms of this Agreement.

23. **Attorneys Fees.** In addition to any other relief, the prevailing party in any action, whether at law, in equity or by arbitration, to enforce any provision of this Amended MDA shall be entitled to its costs of action including a reasonable attorneys' fee.

24. **Entire Agreement.** This Amended MDA, and all Exhibits thereto, is the entire agreement between the Parties and may not be amended or modified except either as provided herein or by a subsequent written amendment signed by all parties.

25. **Headings.** The captions used in this Amended MDA are for convenience only and are not intended to be substantive provisions or evidences of intent.

26. **No Third Party Rights/No Joint Venture.** This Amended MDA does not create a joint venture relationship, partnership or agency relationship between the City and Master Developer. Further, the parties do not intend this Amended MDA to create any third-

party beneficiary rights. The parties acknowledge that this Amended MDA refers to a private development and that the City has no interest in, responsibility for or duty to any third parties concerning any improvements to the New Rosecrest Property unless the City has accepted the dedication of such improvements at which time all rights and responsibilities for the dedicated public improvement shall be the City's.

27. **Assignability.** The rights and responsibilities of Master Developer under this Amended MDA may be assigned in whole or in part by Master Developer with the consent of the City as provided herein.

27.1. **Certain Sales not an Assignment.** Master Developer's selling or conveying lots in any approved Subdivision or Parcels to builders, users, or Subdevelopers, shall not be deemed to be an "assignment" subject to the above-referenced approval by the City unless specifically designated as such an assignment by the Master Developer.

27.2. **Related Party Transfer.** Master Developer's transfer of all or any part of the New Rosecrest Property to any entity "related" to Master Developer (as defined by regulations of the Internal Revenue Service), Master Developer's entry into a joint venture for the development of the Project or Master Developer's pledging of part or all of the Project as security for financing shall also not be deemed to be an "assignment" subject to the above-referenced approval by the City unless specifically designated as such an assignment by the Master Developer. Master Developer shall give the City Notice of any

event specified in this sub-section within ten (10) days after the event has occurred. Such Notice shall include providing the City with all necessary contact information for the newly responsible party.

27.3. **Notice.** Master Developer shall give Notice to the City of any proposed assignment and provide such information regarding the proposed assignee that the City may reasonably request in making the evaluation permitted under this Section. Such Notice shall include providing the City with all necessary contact information for the proposed assignee.

27.4. **Deemed Approved.** Unless the City objects in writing within twenty (20) business days the City shall be deemed to have approved of and consented to the assignment.

27.5. **Partial Assignment.** If any proposed assignment is for less than all of Master Developer's rights and responsibilities then the assignee shall be responsible for the performance of each of the obligations contained in this Amended MDA to which the assignee succeeds. Upon any such approved partial assignment, Master Developer shall be released from any future obligations as to those obligations which are assigned but shall remain responsible for the performance of any obligations that were not assigned.

27.6. **Grounds for Denying Assignment.** The City may only withhold its consent if the City is not reasonably satisfied of the assignees financial ability to perform the obligations of Master Developer proposed to be assigned. Any

refusal of the City to accept an assignment shall be subject to the “Meet and Confer” and “Mediation” processes specified in Sections 6.10 and 6.12. If the refusal is subject to Arbitration as provided in Section 6.13 then the parties shall follow such processes.

27.7. **Assignee Bound by this Amended MDA.** Any assignee shall consent in writing to be bound by the assigned terms and conditions of this Amended MDA as a condition precedent to the effectiveness of the assignment.

28. **Binding Effect.** If Master Developer sells or conveys Parcels of lands to Subdevelopers or related parties, the lands so sold and conveyed shall bear the same rights, privileges, Intended Uses, configurations, and Density as applicable to such Parcel and be subject to the same limitations and rights of the City when owned by Master Developer and as set forth in this Amended MDA without any required approval, review, or consent by the City except as otherwise provided herein.

29. **No Waiver.** Failure of any party hereto to exercise any right hereunder shall not be deemed a waiver of any such right and shall not affect the right of such party to exercise at some future date any such right or any other right it may have.

30. **Severability.** If any provision of this Amended MDA is held by a court of competent jurisdiction to be invalid for any reason, the parties consider and intend that this Amended MDA shall be deemed amended to the extent necessary to make it consistent with such decision and the balance of this Amended MDA shall remain in full force and affect.

31. **Force Majeure.** Any prevention, delay or stoppage of the performance of any

obligation under this Agreement which is due to strikes, labor disputes, inability to obtain labor, materials, equipment or reasonable substitutes therefor; acts of nature, governmental restrictions, regulations or controls, judicial orders, enemy or hostile government actions, wars, civil commotions, fires or other casualties or other causes beyond the reasonable control of the party obligated to perform hereunder shall excuse performance of the obligation by that party for a period equal to the duration of that prevention, delay or stoppage.

32. **Time is of the Essence.** Time is of the essence to this Amended MDA and every right or responsibility shall be performed within the times specified.

33. **Appointment of Representatives.** To further the commitment of the parties to cooperate in the implementation of this Amended MDA, the City and Master Developer each shall designate and appoint a representative to act as a liaison between the City and its various departments and the Master Developer. The initial representative for the City shall be the Mayor and the initial representative for Master Developer shall be Don Wallace. The parties may change their designated representatives by Notice. The representatives shall be available at all reasonable times to discuss and review the performance of the parties to this Amended MDA and the development of the Project.

34. **Mutual Drafting.** Each party has participated in negotiating and drafting this Amended MDA and therefore no provision of this Amended MDA shall be construed for or against either party based on which party drafted any particular portion of this Amended MDA.

35. **Applicable Law.** This Amended MDA is entered into in the City in the State of Utah and shall be construed in accordance with the laws of the State of Utah irrespective of Utah's choice of law rules.

36. **Venue.** Any action to enforce this Amended MDA shall be brought only in the Third District Court for the State of Utah, Salt Lake County.

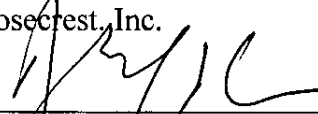
37. **Recordation and Running with the Land.** This Amended MDA shall be recorded in the chain of title for the Project. This Amended MDA shall be deemed to run with the land. The data disk of the City's Vested Laws, Exhibit "D", shall not be recorded in the chain of title. A secure copy of Exhibit "D" shall be filed with the City Recorder and each party shall also have an identical copy.

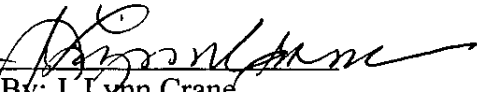
38. **Authority.** The parties to this Amended MDA each warrant that they have all of the necessary authority to execute this Amended MDA. Specifically, on behalf of the City, the signature of the Mayor of the City is affixed to this Amended MDA lawfully binding the City pursuant to Ordinance No. 08-26 adopted by the City on December 18, 2008. This Amended MDA is approved as to form and is further certified as having been lawfully adopted by the City by the signature of the City Attorney.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement by and through their respective, duly authorized representatives as of the day and year first herein above written.

MASTER DEVELOPER
South Farm, L.L.C. and
Rosecrest, Inc.

CITY
City of Herriman


By: Donald E. Wallace
Its: Manager, Vice President/COO


By: J. Lynn Crane
Its: Mayor

Approved as to form and legality:

Attest:


John Brems
City Attorney


Kristi Peterson
City Recorder

CITY ACKNOWLEDGMENT

STATE OF UTAH)
) :ss.
COUNTY OF SALT LAKE)

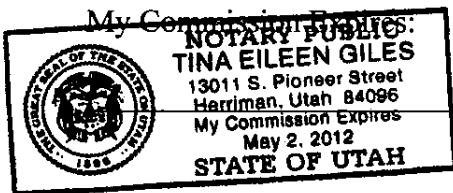


On the 23 day of December, 2008, personally appeared before me J. Lynne Crane who being by me duly sworn, did say that he is the Mayor of City of Herriman, a Utah municipal corporation, and that said instrument was signed in behalf of the City by authority of its governing body and said Mayor acknowledged to me that the City executed the same.


NOTARY PUBLIC

Residing at:

Herriman City



DEVELOPER ACKNOWLEDGMENT

STATE OF UTAH)
)
:SS.
COUNTY OF SALT LAKE)

On the 23 day of December, 2008, personally appeared before me Donald E. Wallace, who being by me duly sworn, did say that he is the Manager, Vice President, COO of South Farm, LLC , a Utah limited liability company and Rosecrest, Inc., a Utah corporations, and that the foregoing instrument was duly authorized by the company at a lawful meeting held by authority of its operating agreement and signed in behalf of said company.

Tina Eileen Giles
NOTARY PUBLIC

My Commission Expires:

Residing at:

Herriman City

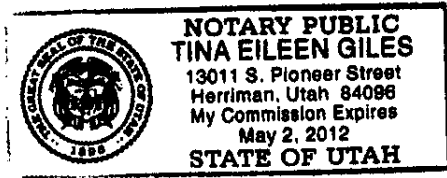
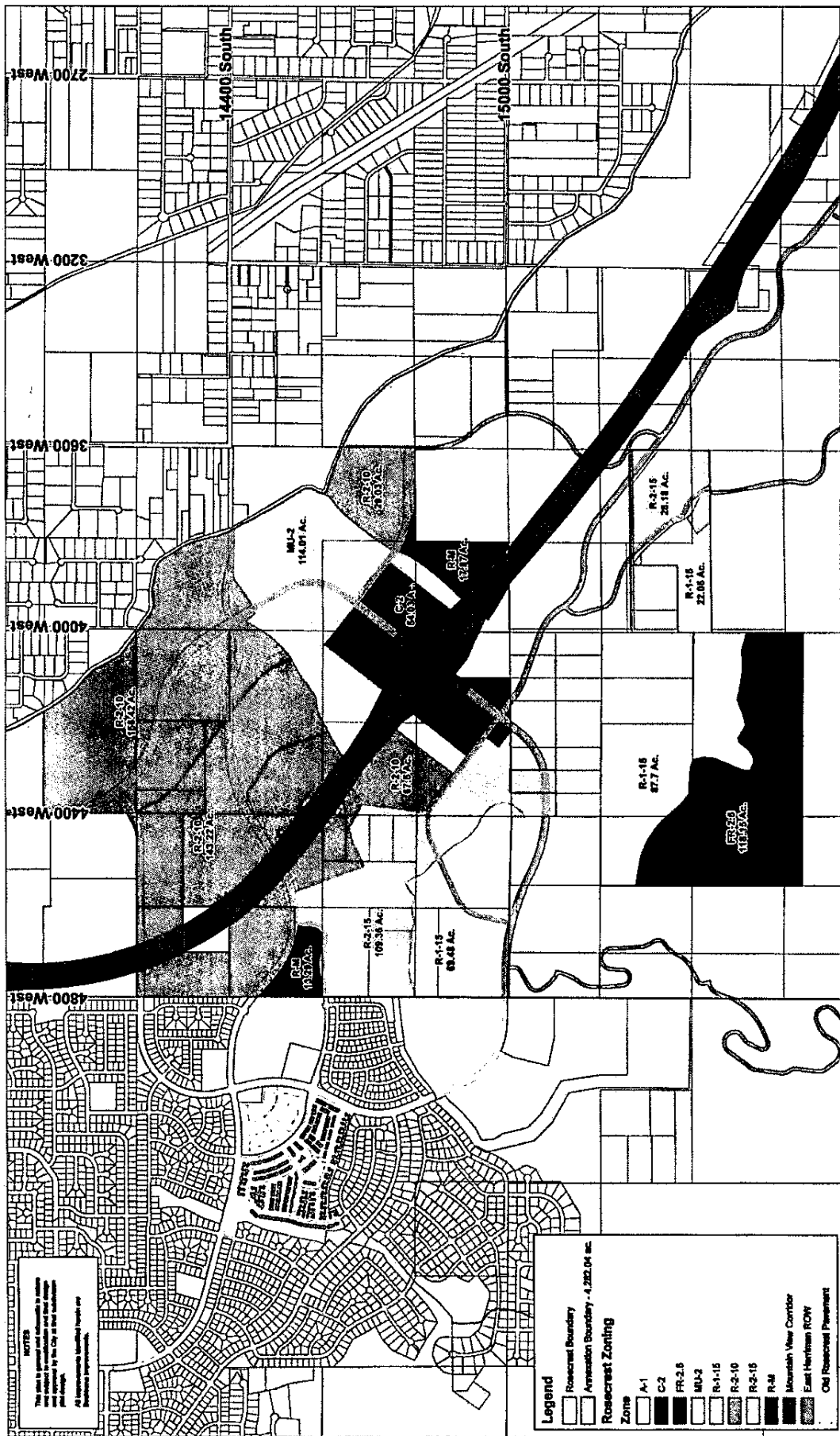
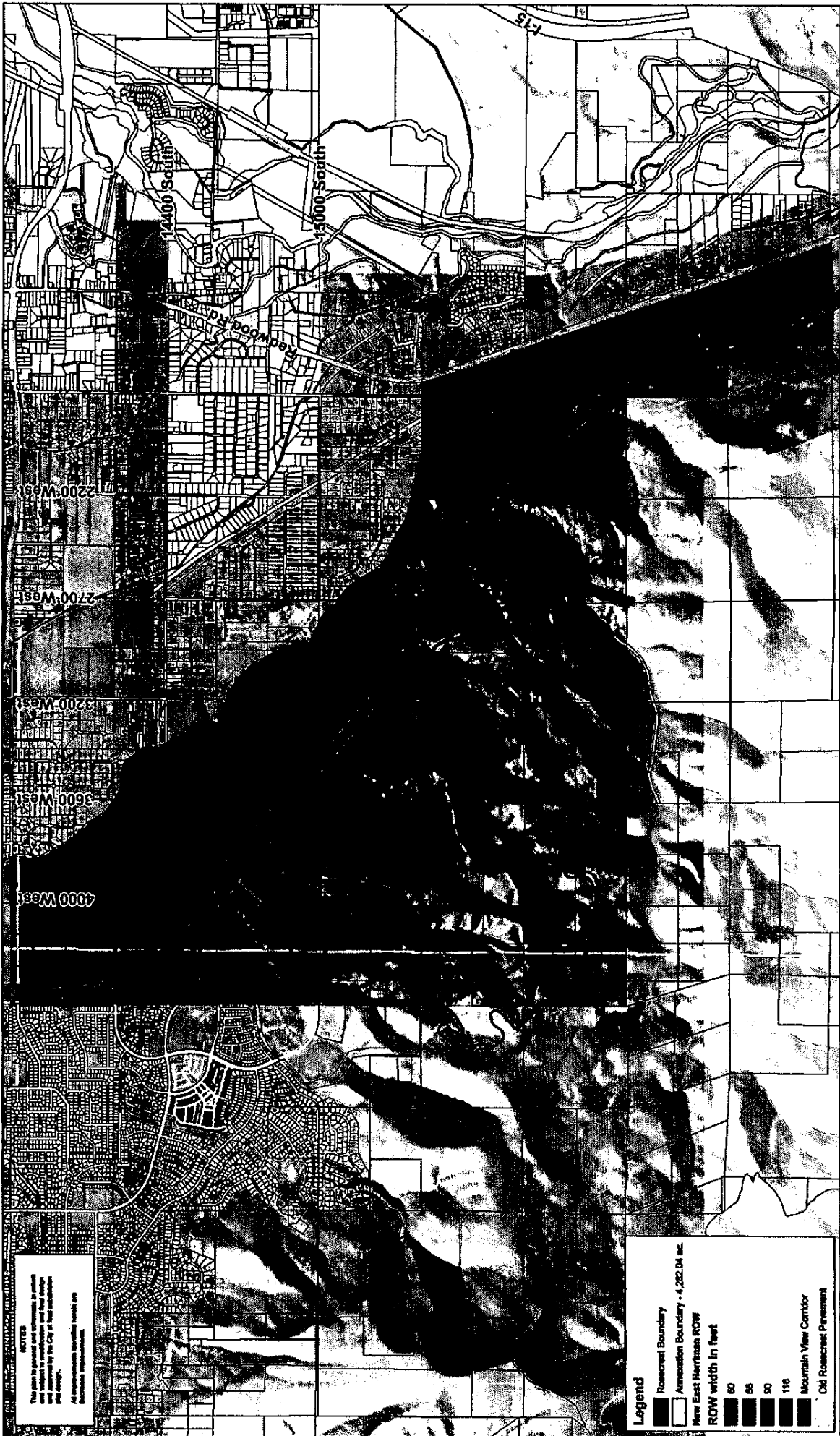


TABLE OF EXHIBITS

Exhibit "A"	Legal Description of New Rosecrest Property
Exhibit "A-1"	Legal Description of Current Rosecrest Property
Exhibit "B"	General Plan
Exhibit "C"	Approved PUD
Exhibit "D"	City's Vested Laws
Exhibit "E"	Infrastructure Plan
Exhibit "F"	Technical Guidelines
Exhibit "G"	Zoning Map





NOTES
 This plan is prepared with reference to certain laws and ordinances of the City of Herriman and is subject to change without notice.
 All dimensions are approximate and subject to field survey.
 All dimensions are approximate and subject to field survey.

Legend

- Rosecrest Boundary
- Annexation Boundary - 4,232.04 ac.
- New East Herriman ROW
- ROW width in feet**
- 60
- 66
- 50
- 116
- Mountain View Corridor
- Old Rosecrest Pavement



Master Transportation Plan

The Sorenson Group





407723

This map is designed to provide a general overview of the proposed trail network. It is not intended to be used as a legal document. The City of Berkeley is not responsible for any errors or omissions on this map. All information is based on the best available data at the time of printing. The City of Berkeley reserves the right to modify or update this map at any time without notice. This map is provided as a service to the public and is not intended to be used for any other purpose. All information is based on the best available data at the time of printing. The City of Berkeley reserves the right to modify or update this map at any time without notice. This map is provided as a service to the public and is not intended to be used for any other purpose.

- Legend**
- Reserve Boundary
 - Amendment Boundary - 4,282.04 ac.
 - Trails Plan**
 - Type of trail**
 - Trail
 - Bonville Shoreline Trail (Possible Route)
 - Bonville Shoreline Trail (Preferred Route)
 - Equatorial Protection Trail
 - Urban Trail
 - Hiking Trail
 - 2008-04-17 - MVC
 - Land Uses**
 - Development
 - AVCD
 - Open Space
 - Mountain View Corridor
 - East Hillman ROW
 - Old Rosewood Pavement



The Sorenson Group

Parks & Trails Master Plan

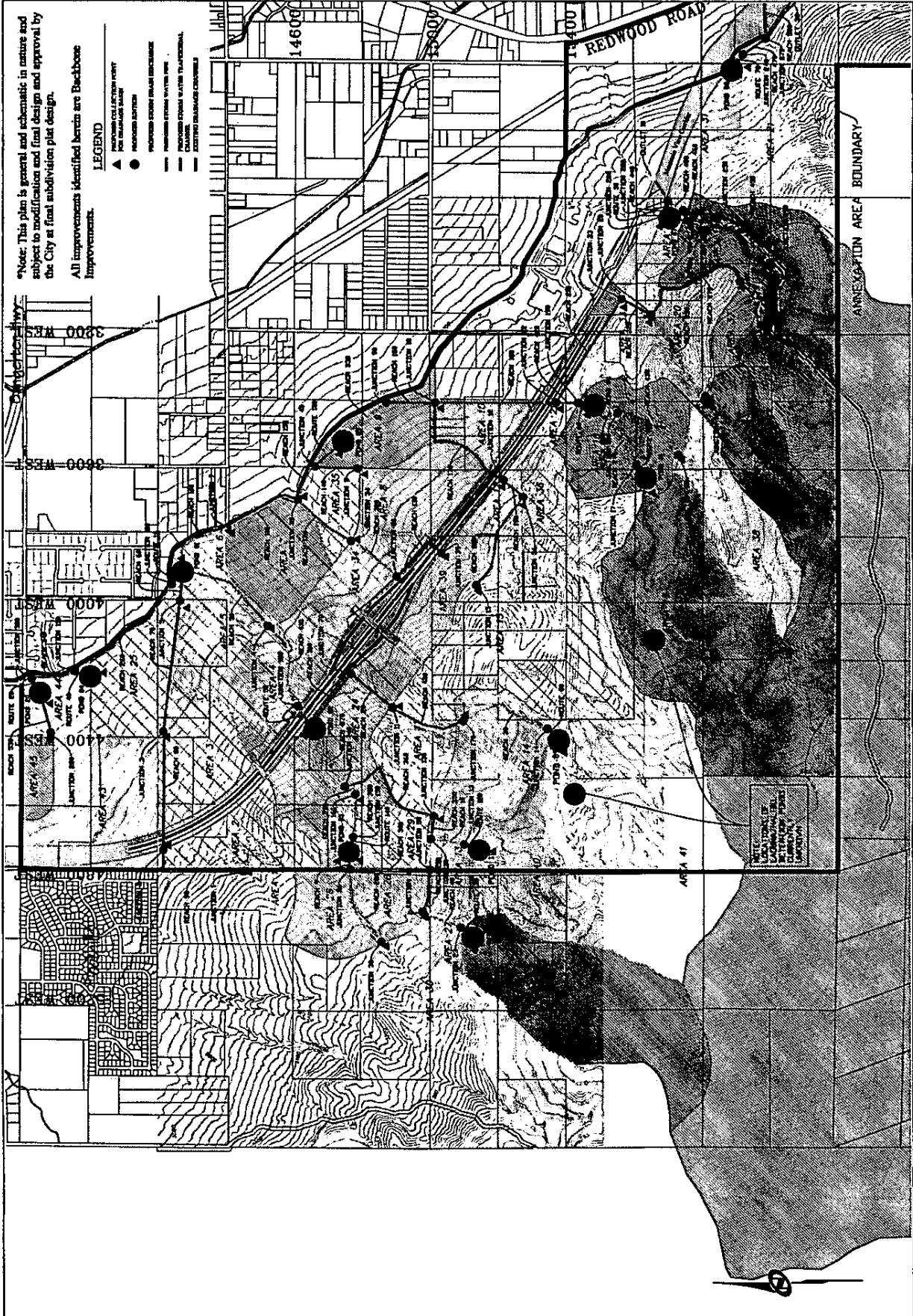


ROSECREST
 &
 SOUTH HILLS
 MASTER PLANNED
 COMMUNITIES

STORM DRAIN PLANS
 WITH DRAINAGE BASINS

DRAWN BY:	RWC
DATE:	11-19-2007
CPIN#:	SLB0311
REVISION DATE:	11-19-2007
ORIGINAL DATE:	11-19-2007
PROJECT NAME:	STORM DRAIN WITH DRAINAGE BASINS

SHEET
 1/2



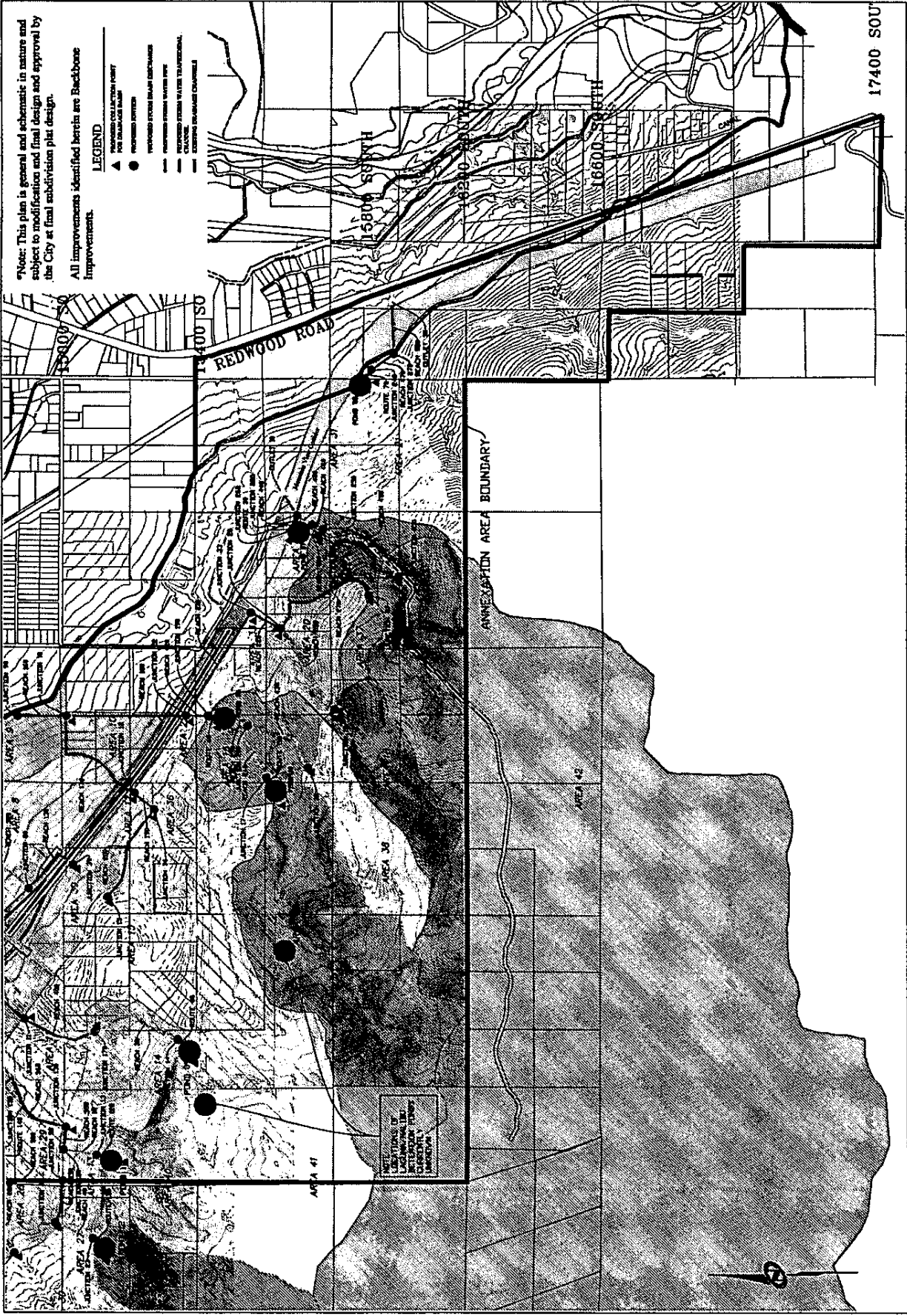
DWG:SDA/FDSF

**ROSECREST
+
SOUTH HILLS**
MASTER PLANNED
COMMUNITIES

**STORM DRAIN PLAN
WITH DRAINAGE BASINS**

DRAWN BY:	RWC
DATE:	11-19-2007
CP#:	11-19-2007
SL#:	SLB0311
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ORIGINAL DATE:	11-19-2007
PROJECT NAME:	STORM DRAIN WITH DRAINAGE BASINS

SHEET
2/2



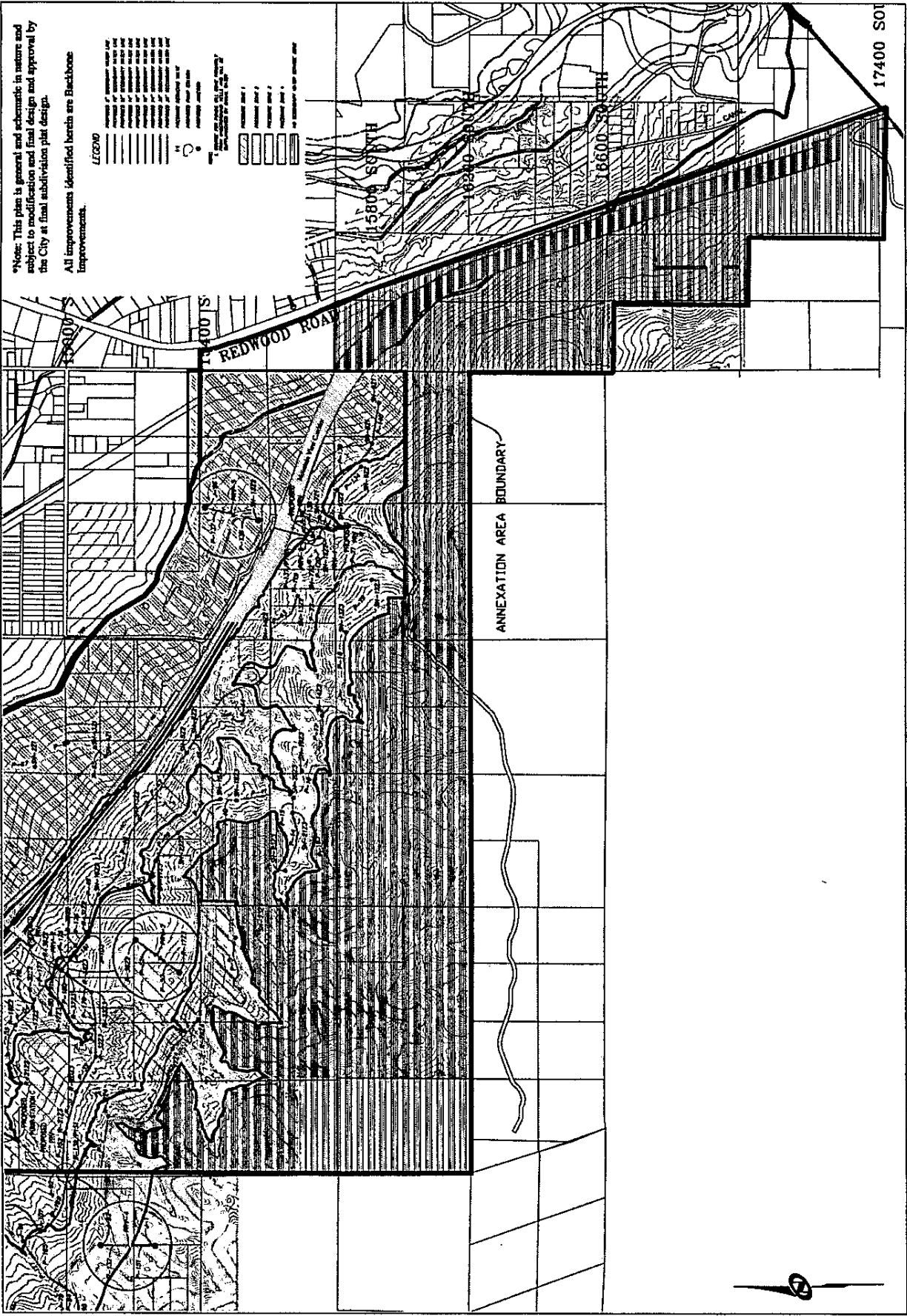
DWG

ROSECREST
 +
 SOUTH HILLS
 MASTER PLANNED
 COMMUNITIES

SECONDARY WATER PLAN
 PRESSURE BOUNDARIES

DRAWN BY: RWC
 DATE: 11-19-2007
 JOB NO: SLE0311
 REV/ISSN DATE: 11-19-2007
 ORIGINAL DATE: 11-19-2007
 PROJECT NAME: PRESSURE BOUNDARIES MODEL LAYOUT

SHEET 2/2



*Note: This plan is general and schematic in nature and subject to modification and final design and approval by the City at final subdivision plat design.

All improvements identified herein are Backbone Improvements.

ANNEXATION AREA BOUNDARY



NO.	DATE	BY	DESCRIPTION
1	02/20/08	JG	Final Review
2	02/20/08	JG	Final Review
3	02/20/08	JG	Final Review

SCALE (HORIZ): 1"=200'
SCALE (VERT): 1"=200'
DATE: 12/19/08
DESIGN BY: SPK
SCALE (VERT): NA
ENERGY PROJECT NO. 1818

1111 East Draper Parkway
 Suite 103
 Draper, Utah 84020
 Tel: 801-748-1190
 Fax: 801-748-1119

SYNERGY
 CONSULTANTS

SOUTH HILLS & ROSECREST
Culinary Water Master Plan
 HERRIMAN, UTAH

EX-3

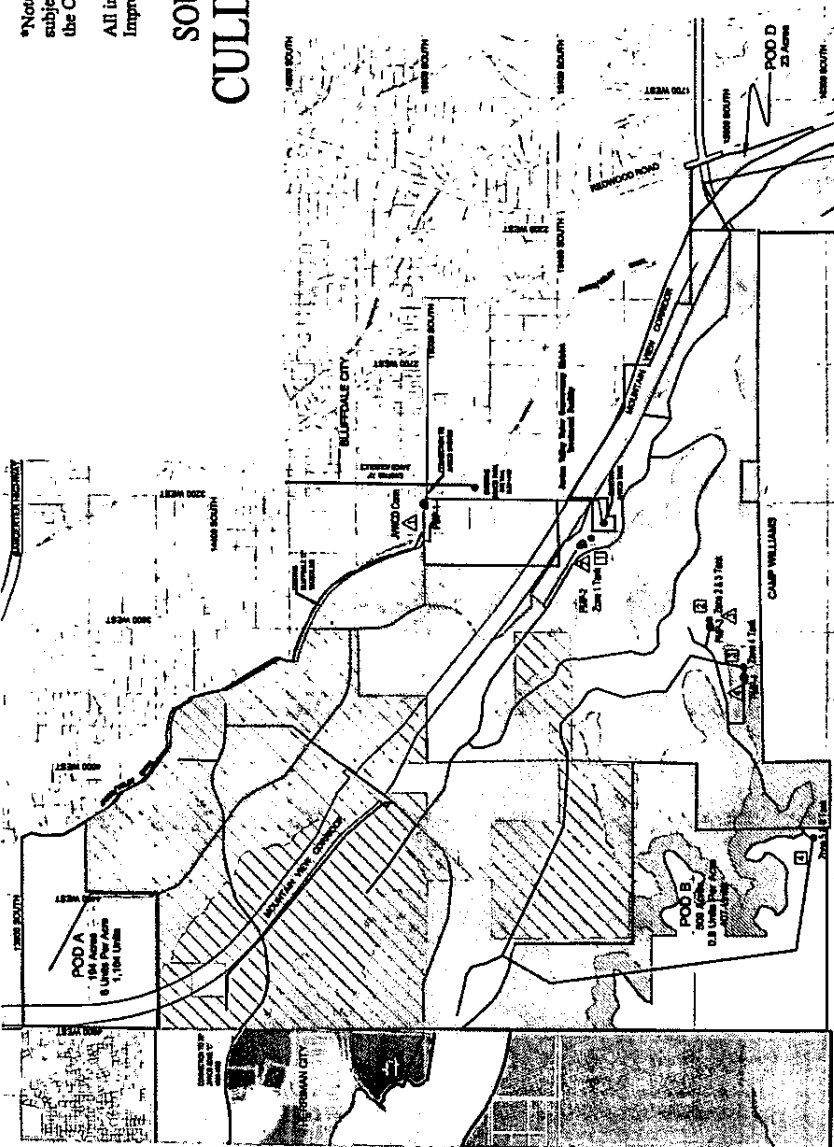
*Note: This plan is general and schematic in nature and subject to modification and final design and approval by the City at final subdivision plat design.
 All improvements identified herein are Backbone Improvements.

SOUTH HILLS & ROSECREST
CULINARY WATER PLAN
 HERRIMAN, UTAH



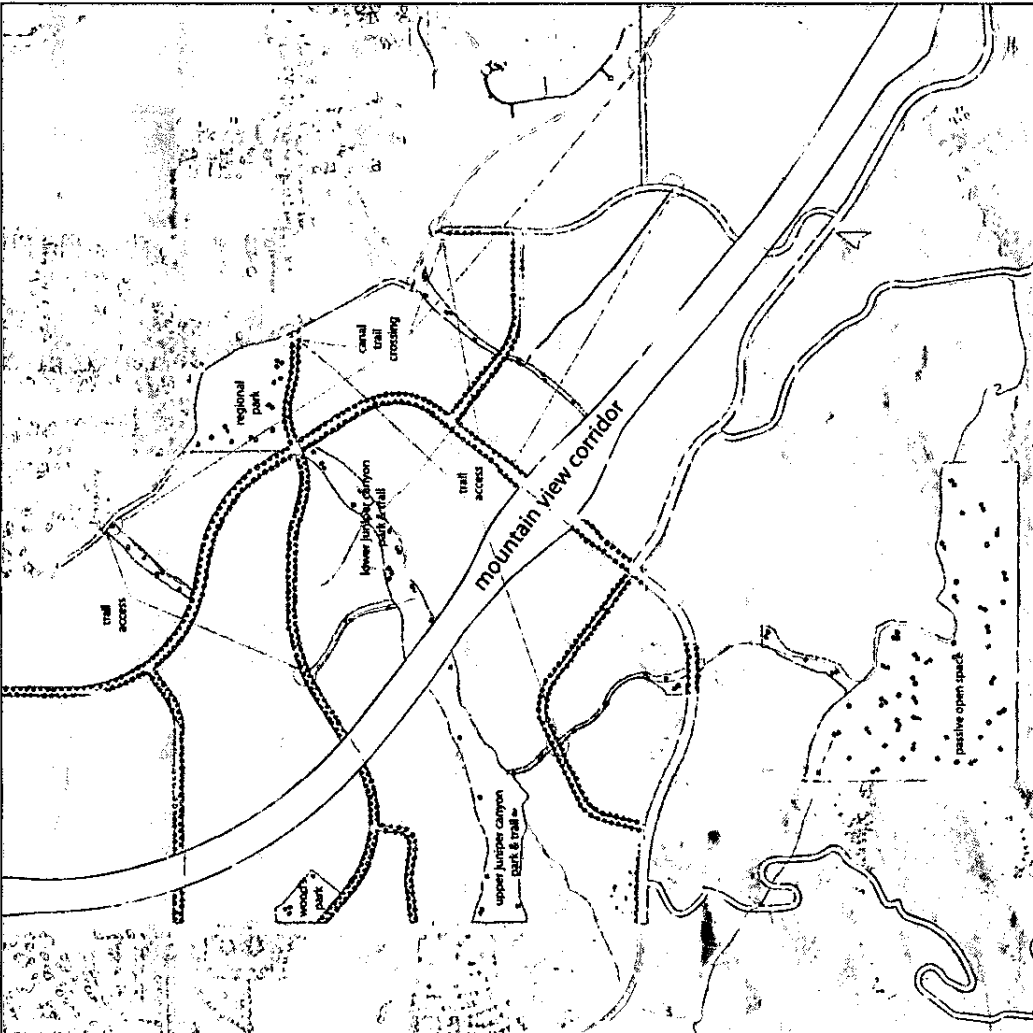
Color Coding Legend
 Pipe Diameter (in)

cs 8.0
cs 12.0
cs 14.0
cs 18.0
cs 20.0
cs 24.0
cs 30.0



LEGEND

PROPOSED	EXISTING	CULINARY ZONE BOUNDARIES	PUMP STATION CAPACITY (PEAK DAY)	STORAGE REQUIREMENTS	TANK BASE ELEVATION
[Pattern]	[Pattern]	ZONE 1 4715-4820	△ 8400 cfm	□ ZONE 1 TANK 3 MG	6965 MODEL
[Pattern]	[Pattern]	ZONE 2 4820-4990	△ 6300 cfm	□ ZONE 2 & 3 TANK 4.3 MG	5129 MODEL
[Pattern]	[Pattern]	ZONE 3 4990-5120	△ 2400 cfm	□ ZONE 4 TANK 1.1 MG	5391 MODEL
[Pattern]	[Pattern]	ZONE 4 5120-5279	△ 1800 cfm	□ ZONE 5 & 6 TANK 1.4 MG	5450 MODEL
[Pattern]	[Pattern]	ZONE 5 5279-5390			
[Pattern]	[Pattern]	ZONE 6 5390-5500			



OPEN SPACE LAND USE CALC'S

Pod #	Area (acres)	Type
6	2.05	passive
12	5.89	Active
16	4.38	Passive
18	28.54	Active
21	2.19	passive
26	29.14	Active
27	10.66	Active
28	5.58	Active
29	6.72	Passive
35	0.71	Passive
38	3.40	Passive
50	1.26	Passive
56	0.22	Passive
63	117.89	Passive
96	0.72	Active
143	4.12	Passive
Total	223.47	

Total Site Area	1,179.68
Mountain View Corridor	63.06
Major Rights of Way	60.94
Net Site Area	1,055.68
Total Open Space	223.47
	21%

Total Landscaped Open Space	80.53
Total Natural Open Space	142.94

Total Multi-family	79.90
Required Open Space (20%)	15.98
Provided Open Space	15.98
	20%

Total Mixed Use	112.10
Required Open Space (15%)	16.82
Provided Open Space	16.82
	15%

General Notes:
 *The Active Open Space acreage indicated does not include any pocket parks.
 **Open Space for Multi-family was calculated at 20% and is not shown graphically.
 ***Open Space for Mixed Use was calculated at 15% and is not shown graphically.
 ****Acres of open space for mixed use and multi-family are not included in the numbers shown on the Open Space Plan

Legend

- urban trail
- trail
- equestrian/ pedestrian trail
- hiking trail
- property boundary



PARKS & TRAILS MASTERPLAN

"ROSECREST EAST HERRIMAN"



HERRIMAN CITY



Adopted
April 3, 2008

EAST AREA MASTER PLAN

HERRIMAN CITY EAST AREA MASTER PLAN

Adopted April 3, 2008



CONTENTS

PART 1 – Background

PART 2 – Vision

PART 3 – Future land use

1. Environment
2. Land Use
3. Parks, Open Space and Trails
4. Institutions
5. Public Services & Transportation
6. Economic
7. Military Activities

PART 4 – Implementation

PART 1 – Background

1.1 Plan purpose

The Herriman East Area Master Plan is a special area plan that is an amendment to Herriman City's General Plan (adopted June 2, 2001). This plan is intended to provide a broad, comprehensive vision for the development and preservation of land, water and other resources within the planning area. For the purposes of this document this plan is referred to as the "East Area Master Plan" and the area is referred to as the "East Plan Area."

As part of Herriman's General Plan, The East Area Master Plan is a guiding document

"to help guide zoning, budgeting, capital improvement decisions, and public policy making. The objectives in the plan are intended as direction towards establishing a flexible guide for achieving balanced growth and preserving the unique character of the City." (Herriman City's General Plan, June 2, 2001)

The fundamental purposes of the General Plan and special area master plans include *(adapted from the 2001 General Plan)*:

- Continue the established Community Identity
- Manage Density
- Minimize Impacts of Growth
- Improve the Physical Environment
- Promote Public Interest
- Facilitate the Implementation of Public Policy
- Encourage Long Range Objectives vs. Short Range Actions

This plan encourages community development and growth that is functional and efficient, as well as prosperous and visually aesthetic promoting inclusionary development where applicable. Its primary topics are environment, land use, transportation, economy, and utilities and public services.

As the 2001 Herriman General Plan does not address this area and is not updated to reflect the current conditions of rapid growth and urbanization in Herriman, it is recommended that the General Plan be updated, as needed, to reflect the East Area Master Plan.

1.2 Planning Area

The East Plan encompasses a largely undeveloped area, approximately 4,958 acres (7.7 square miles), to the south and east of Herriman, adjacent to Bluffdale City, Riverton City and Camp Williams *(see Map 1: Herriman City Boundaries and Annexation Area)*. Most of this area was once incorporated into Bluffdale City while others were once in unincorporated Salt Lake County. A small portion was already within city limits. The newly annexed portions of the East Plan Area were approved by the City Council for annexation into Herriman in October 2007 and went into effect in January 2008.

This area can be characterized primarily as a foothill area, encompassing parts of the west spur of Traverse Mountain and the gently sloping lands that lead up to it. The former use of most of this land is dry land farming, grazed pasture and natural open space. The primary constraint to growth is steep slopes in some portions of the area, but the majority of the land has few constraints or hazards. Proposals for developing this area have been made for over a decade, but until Herriman's annexation of the area, were unrealized.

The proposed land uses include a mix of residential, commercial, and institutional (schools, churches) to serve this area. It includes several public facilities that will continue to operate under existing ownership and arrangements, including the Jordan Valley Water Treatment Plant and Rocky Mountain Power substation. A critical change in this area is the proposed addition of a major freeway, the Mountain View Corridor, and potential major transit line,

likely Bus Rapid Transit. The addition of these two transportation routes provides new access and impetus for a significantly different land use pattern.

The primary opportunity Herriman City seeks in the East Plan Area is additional retail, commercial and office space. The City wishes to build a balanced community, diversify its revenues and offer employment to residents. It also plans to optimize its opportunity for transit-oriented development. The East Plan Area is a prime location and opportunity for such development.

1.3 Population Growth

Herriman City is experiencing unprecedented growth. In the 2000 Census, Herriman City was one of the fastest growing cities in Utah. Between the years 2002-2003, Herriman grew 34.7%. This pace of growth has been maintained through the ensuing years. Despite a slowdown in new residential construction across Utah, demand for new homes in Herriman has remained strong. Home prices in the 84065 zip code (Riverton + Herriman)¹ rose 26% in 2006 and 20% in 2007 (Source: Wasatch Front Regional Multiple Listing Service). The number of building permits and the value of the homes constructed has also been on the rise and the number of permits issued has also risen dramatically since 2000, as shown in Table 1: Single Family Dwelling Permits Issued, below. Currently, the southwest corner of Salt Lake Valley is arguably the hottest spot for real estate and likely will remain so for the coming decade as this is one of the last areas of the valley with new homes being built and it has become one of the most desirable locations as well.

Year	\$200,000 or less	\$200,001 to \$300,000	\$300,001 to \$400,000	\$400,001 to \$500,000	over \$500,000	Total
1999	166	1	0	0	0	167
2000	324	10	0	0	0	334
2001	399	8	0	0	1	408
2002	450	19	1	0	0	470
2003	634	74	3	0	1	712
2004	587	139	2	0	0	728
2005	523	346	17	3	1	890
2006	195	252	34	2	0	483

Source: Herriman City Building Department, Nov. 2007

The 2005 base population for Herriman was calculated at 12,414 residents. (Source: Herriman City Transportation Master Plan – Appendix B). At that time and with its current boundaries, Herriman was predicted to grow to 25,000 residents. Today, the buildout estimate with new annexation areas is closer to 100,000 residents. With the addition of the East Plan Area, Herriman is currently projected to be the fastest growing city in Salt Lake County. For this plan, the 2007 Herriman City population is estimated at 17,500.

Predicting population growth by year is somewhat speculative. Estimating overall population at city build-out, regardless of timeframe, can be more tangible. The Wasatch Front Regional Council estimated Herriman’s buildout population at 37,000 to 42,000 people, based on 2005 city boundaries. The Herriman Transportation Master Plan estimated buildout population of 45,000 within 2005 city boundaries at current proposed land uses. The

¹

Transportation Master Plan also estimated that annexation of the lands west of 7200 West could add another 20,000 residents, but did not consider the East Parcel Area.

For the purposes of this General Plan, a simple population calculation was conducted by multiplying approximate population for each proposed land use by the area of each. (See *Table 2: Proposed Land Use and Population*) This calculation shows that the addition of the East Plan Area could add approximately 17,000 to 48,000 residents. Thus, the estimated buildout population of Herriman with the East Plan Area may be 73,000 to 113,000 residents.

This calculation shows the East Parcel Area (7.7 square miles) has a potential average population density of 3,328 (low) to 9,176 (high) people per square mile, or 5.2 (low) to 14.3 (high) people per acre. The potential average housing density is 2.76 units per acre over the entire East Plan Area and 2.66 units per acre for residential areas only (excluding mixed use). In summary, the land area of the East Plan Area and proposed additional population is large, but proposed overall population densities are still quite low compared to the Salt Lake Valley average. The current average density in Herriman is approximately 2.0 units per acre.

Land Use	Acres (approx.)	du/acre (low)	du/acre (high)	persons per unit (avg) ¹	Est. population (low)	Est. population (high)
Hillside Residential	1,438	0.5	1.5	2.5	1,792	5,391
Low Density Residential	982	1.5	2.5	3.49	5,139	8,564
Medium Density Residential	778	2.5	8	2.5	4,863	15,560
High Density Residential	120	8	20	2.5	2,400	6,000
Mixed Use ²	460	9	30	1.7	3,050	12,043
Commercial	202	0	0	0	0	0
Business and Industrial Park	101	0	0	0	0	0
Infrastructure and Utilities ³	475	0	0	0	0	0
Military Operations	317	0	0	0	0	0
Institutional ⁴	86	0	0	0	0	0
Parks and Open Space ⁵	(1,368)	0	0	0	0	0
Total⁶	4,958				17,248	47,558
Average per acre⁷		1.91	6.12	2.54	5.20	14.34

Notes:

1. Persons per unit based on averages used in *Herriman City Transportation Master Plan, 2007*.
2. No maximum adopted, estimate of likely maximum is given. Minimum is based on 13 du/acres for 30% of site. Maximum is based on 22 du/acres for 70% of land in residential use.
3. Includes roads (Mtn. View Corridor), public utilities (water district).
4. Schools, churches, libraries, public safety. Includes only currently designated sites, but likely will have 200 additional acres.
5. Not included in total calculation. Will be created from land zoned for other uses, but reserved as open space.
6. Acreages are estimates only, and do not exactly add up to overall area.
7. Includes residential uses only, excluding mixed use.

1.4 Planning Process

In August 2007, Herriman City reviewed a Request for Annexation Application initiated by several major landowners in the East Plan area. Herriman City viewed this proposal as an opportunity to continue to improve and diversify the city as a whole, for the benefit of all residents. The major landowners had prepared conceptual land use plans for a majority of this land. The City worked closely with these landowners to review proposed land uses for compatibility with Herriman City and adjust them as needed to ensure they met the intent of Herriman's existing General Plan and ordinances. On October 30, 2007, the Herriman City Council voted to annex the East Plan area into the city, effective January 1, 2008.

In anticipation of this annexation, Herriman City began preparing the East Area Master Plan. The plan drew its vision and guiding principles from the General Plan (2001) and the Herriman North Land Use Plan (April 5, 2007). The land use map was based on the conceptual plans prepared by the major land owners, as well as current proposals for the Mountain View corridor, transit lines, and other known future projects. For lands without a specific proposed land use, Herriman City proposed uses most compatible with the adjacent proposals and the underlying natural features. One additional area from within the existing Herriman City boundaries (known as the Laguna-Malibu parcel) is included in the East Plan area as it is not included in previous city land use plans.

1.5 Regulating Land Use

The East Area Master Plan consists of a land use map and a document supporting the configuration of these land uses. Together, these two documents create a focused direction for the development of the community. These documents operate concurrently with the following adopted city plans:

- Herriman City General Plan (2001),
- North Area Master Plan (2007),
- Herriman City Transportation Master Plan (2007),
- Zoning Ordinance and Zoning Map, and
- City Design Guidelines.

An amendment to the City Zoning map is occurring concurrently with this Master Plan to make the two documents consistent with each other. The third level of regulation, building permits, will be required in conformance with the zoning map. The city anticipates that several landowners will use development agreements with the city to clarify and solidify development rights and expectations.

PART 2 – Vision

Herriman has grown tremendously in the last 10 years. The community is no longer dominated by large lots, equestrian properties and agricultural operations. It has grown into a bedroom community with significant, and growing, demands. The housing market has diversified, numerous schools, churches and parks have been constructed, and there is demand for commercial and office space beyond what is currently provided. There are still strong expectations to protect the environment and be economically responsible.

Herriman City wishes to grow into a healthy, diverse, livable community with a unique sense of place. Herriman City's intent in the East Plan Area is to encourage a diversity of land uses and economic balance. The existing landscape should be respected and remain highly functional while providing a beautiful backdrop to the city. New land uses should maintain the quality of life Herriman is known for and shall include a range of housing options, commercial offerings, and lifestyle amenities. Transportation should connect residents to the region with a variety of modes (roads, transit, pedestrian and cyclists). All development should contribute to a balanced economy and fiscal sustainability of the city.

All new development shall be supported at the appropriate level of public infrastructure and services.

The vision for the East Plan Area is outlined here in four major topics:

1. Environment
2. Land Use
3. Transportation
4. Economy

2.1 Environmental Vision

Vision:

The existing landscape should be respected and remain highly functional while providing a beautiful backdrop to the city.

Guiding Principles:

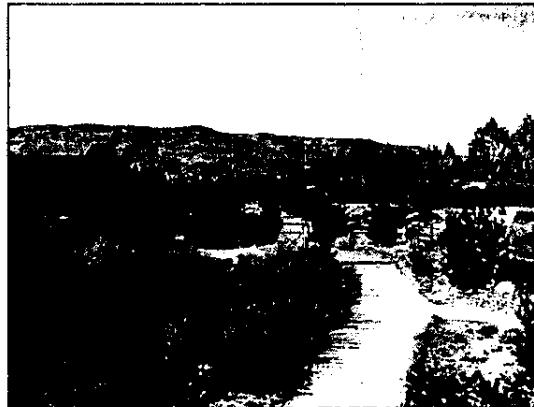
- Protect environmentally sensitive areas:
 - Drainage corridors
 - Wetlands
 - Natural vegetation
 - Wildlife habitat
 - Steep slopes
 - Viewsheds
- Development should make the most of topography and be sensitive to the unique conditions.
- Respect and preserve natural open spaces with the most critical resources, including a diversity of plants and wildlife.
- Provide buffers between development and critical natural resources.

Strategies:

- Identify sensitive landscapes and avoid or mitigate for development in these areas.
- Use density bonuses to encourage preserving sensitive lands.
- Explore partnerships and funding techniques to protect important open spaces.



Protect important native vegetation and wildlife areas.



Incorporate natural open space corridors into development



Minimize the impact of development.



Protect natural drainage corridors and use natural drainage methods.

2.2 Land Use Vision

Vision:

New land uses should maintain the quality of life Herriman is known for and shall include a range of housing options, commercial offerings, and lifestyle amenities.

Guiding Principles:

- Create a sense of place that is unique to Herriman.
- Provide a balance of land uses – commercial, residential, institutional, and public spaces.
- Support a range of housing types for different life stages and incomes, including single- and multi-family options.
- Cluster residential development to protect important open space and natural resources.
- Encourage commercial development to meet local needs and provide some regional draws to provide jobs, services and a diverse tax base.
- Provide a variety of mixed-use community centers that include retail, commercial, housing, and community services.
- Promote walkable development and efficient infrastructure.
- Support future transit with uses and housing densities needed for transit-oriented development.
- Provide recreation close to home that serves a diversity of age groups and interests.
- Support the desires of adjacent landowners to maintain small agricultural practices.
- Protect important views and community assets by directing the location of development and the character of structures built.

Strategies:

- Use design guidelines to create a unified community character.
- Identify and protect commercial locations, including neighborhood, village and regional centers.
- Provide recreation for all residents to be within 1/4 mile of a public park or open space and within 1/4 mile of a trail.
- Establish the City's moderate income housing standards.
- Adopt a Hillside overlay zone to protect important views and natural assets.



Follow design guidelines to create a quality community.



Use front porches and small setbacks to create a welcoming street.

2.3 Transportation Vision

Vision:

Transportation should connect residents to the region with a variety of modes, including vehicles, transit, pedestrian and cyclists.

Guiding Principles:

(adapted from the *Herriman City Transportation Master Plan, 2007*)

- Provide safe and efficient mobility to protect and enhance Herriman's quality of life.
- Maximize transportation connectivity.
- Use access management tools to maximize roadway efficiency.
- Follow Herriman City standard roadway designs to integrate with the existing network.
- Encourage transportation alternatives that reduce the impact on the environment.
- Incorporate bicycle routes and trails into new street designs or into segregated facilities.
- Integrate with regional plans for public transportation.
- Design for full accessibility in all street, sidewalk and trail designs.
- Partner with local, state and federal funding sources.

Strategies:

- Follow the recommendations of the *Herriman City Transportation Master Plan, 2007*.



Street and trail networks should be developed simultaneously.



Local streets should be safe and comfortable.



Arterials should be safe and manage access to help traffic flow.



Major traffic routes should use walls and landscape buffering.

2.4 Economic Vision

Vision:

All development should contribute to a balanced economy and fiscal sustainability of the city.

Guiding Principles:

- Increase Herriman's retail, restaurant, and entertainment options to enhance the Herriman lifestyle
- Develop a base for tax revenues with income generating uses, such as employment, office and commercial
- Increase employment opportunities to provide jobs close to home
- Utilize existing and proposed infrastructure to maximize economic opportunities
- Balance the cost of new development and associated public infrastructure between new and existing city residents who will benefit from it. New development should pay for itself, but will bring new businesses to the city to balance the costs.
- Ensure adequate provision of services by timing development as needed.

Strategies:

- Develop commercial centers to provide local goods, services and jobs.
- Develop an economic development strategy to attract business that will add to the sales, property, and business tax base.
- Follow city design guidelines for centers (commercial, transit-oriented) to ensure they are walkable, comfortable and designed to integrate with the community around them.



Community mixed-use commercial centers provide local services.



Herriman's entertainment and restaurant options need expanding.



A regional commercial center can balance Herriman's economy.



Employment centers can provide tax revenue and jobs close to home.

PART 3 – Future Land Use

3.1 Environmental Element

The environmental element is the basis of Herriman City's planning for the East Plan Area. The City is interested in protecting public health, safety and welfare by protecting important natural resources and avoiding hazardous areas that could threaten human life and property. This plan has been developed to respect the natural environment to the greatest extent possible while developing these lands.

Herriman City requires studies and exhibits of certain environmental hazards to be conducted as a condition for certain development approvals. As needed, Herriman City may request additional studies and third-party reviews of such results to further analyze environmentally sensitive areas.

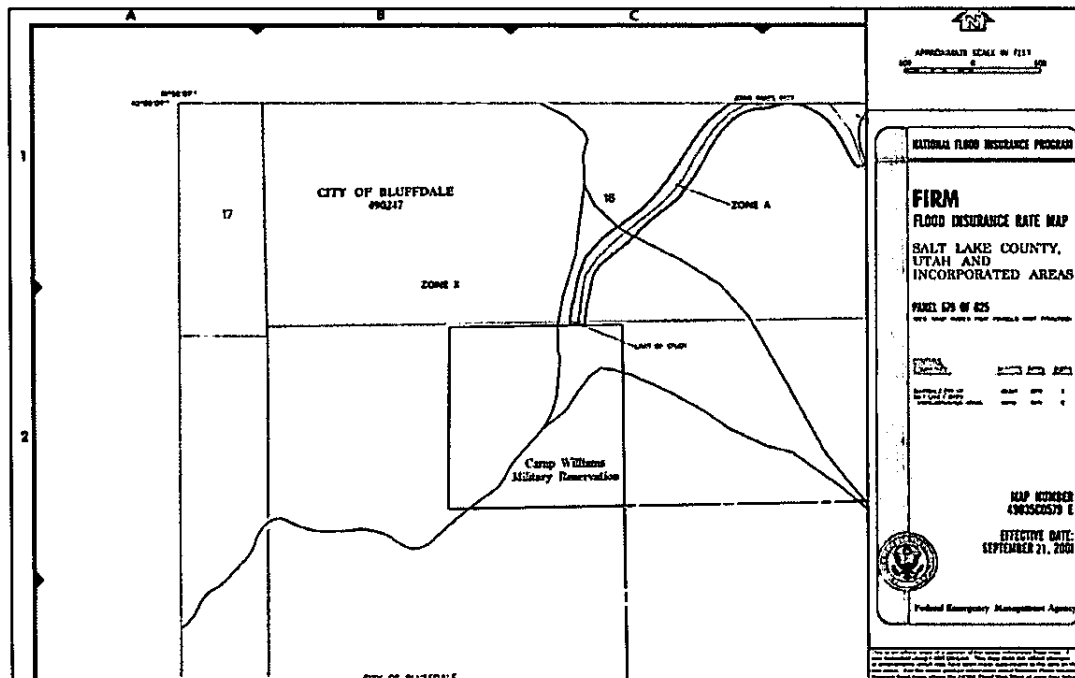
3.1.1 Geologic Hazards

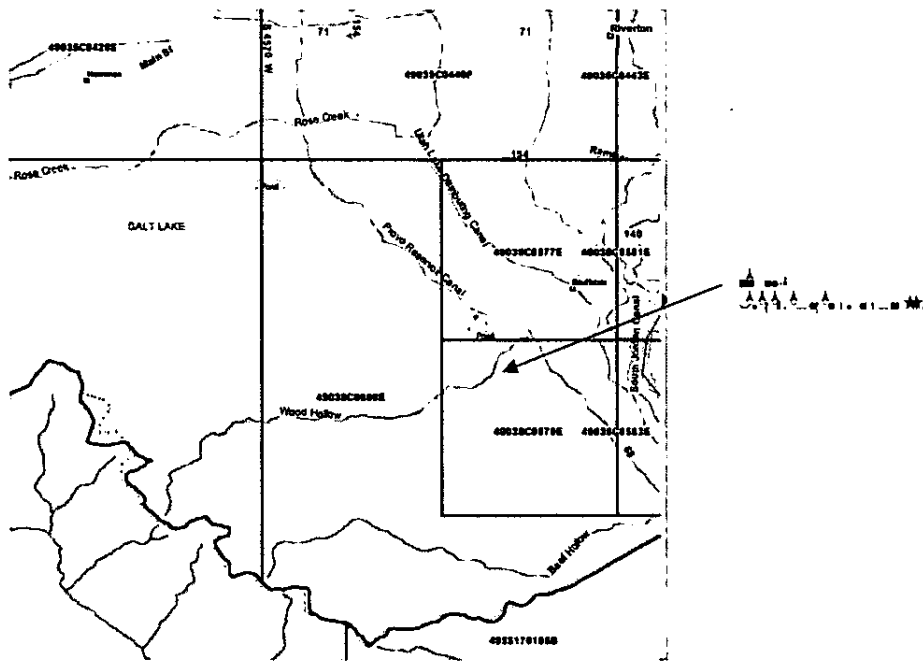
The Wasatch Front has numerous geologic hazards that are found occasionally in Herriman, including fault line hazards, liquefaction areas, and landslide prone areas. No known geologic hazard areas exist in the East Plan Area, but the City may request a natural hazards report, as per city ordinance (19.29), if hazards are suspected or special conditions merit such study.

3.1.2 Floodplain hazards

The majority of the drainages in the East Plan Area are ephemeral (dry) creeks with minor flooding activity. Only one known FEMA-identified special flood hazard areas exists within the East Plan Area. This hazard area lies along the lower reaches of Wood Hollow, as shown on the Flood Insurance Rate Map 49035C0579E (*Figure 1: Flood Insurance Rate map of lower Wood Hollow Drainage and Key Map*). As per city ordinance (19.32), all FEMA-identified special flood hazard areas are adopted by reference and are subject to special regulation.

Figure 1: Flood Insurance Rate Map of lower Wood Hollow Drainage





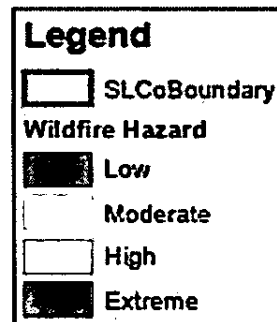
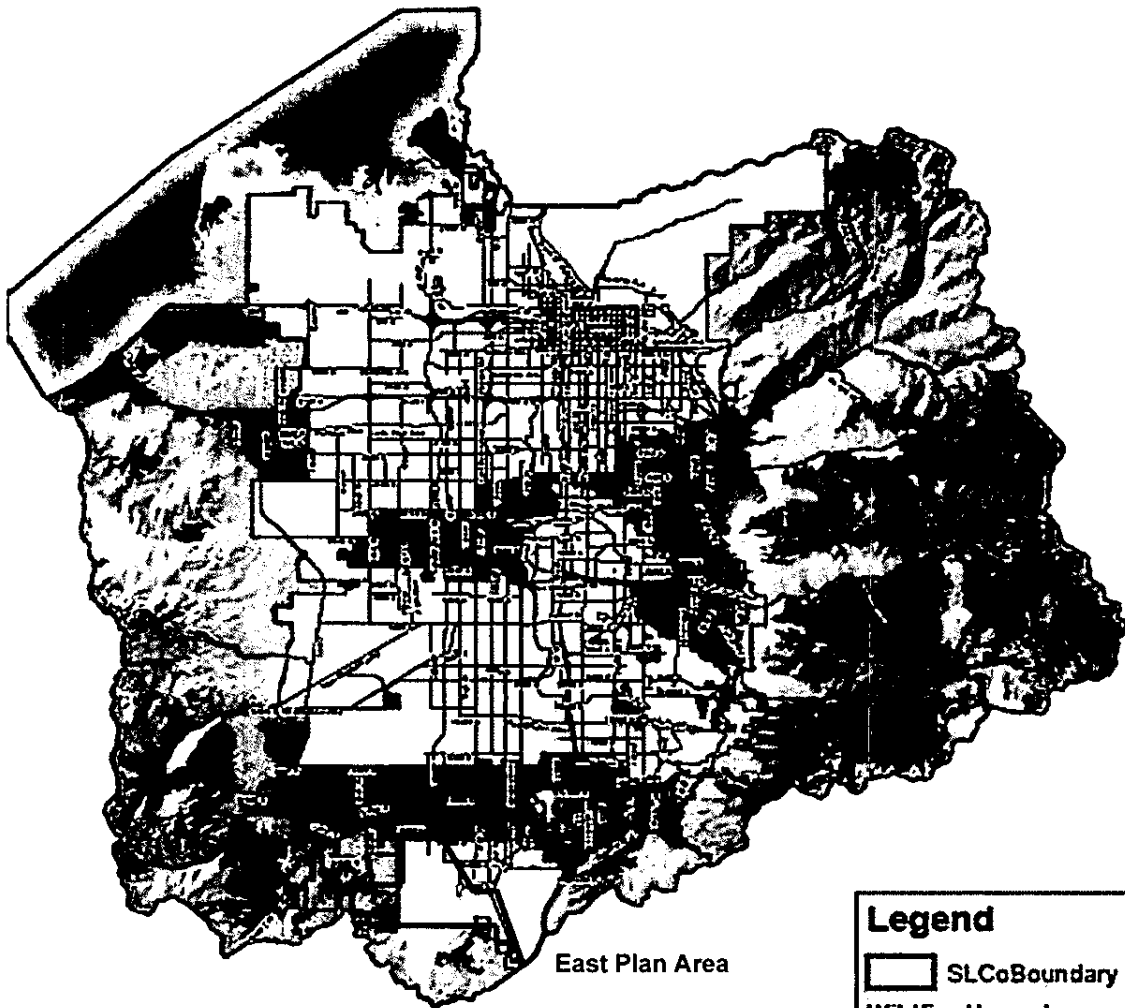
3.1.3 Wildfire hazards

Wildfire is a serious concern in this corner of Herriman City. The dry hillsides in the East Plan Area frequently burn due to both naturally occurring and human-caused fires. Camp Williams to the south frequently is a source of wildfires as artillery and other military operations are prone to creating sparks and fires. Protecting property from damage and humans from harm in this area is a serious concern of Herriman City and Salt Lake County Unified Fire Authority, which provides firefighting services here. The risk of fire and potential damage from fire in this area should be mitigated through special design measures, landscape treatment, and an appropriate relationship between buildings and open spaces to facilitate firefighting operations and slow down the spread of fire.

Salt Lake County Unified Fire Authority (UFA) has mapped the fire risk of unincorporated areas adjacent to Herriman City and the East Plan Area (see *Figure 2: Wildfire Hazard* on the next page). Herriman City is planning to adopt the *Utah Wildland-Urban Interface Code (2006)* into the city building code in 2008. This code requires categorizing new developments into different risk levels, then requiring special fire safety measures for higher risk areas. Such measures include fire resistant materials, sprinklers, landscape mitigation, and structure spacing. Herriman City will require all properties adjacent to Camp Williams or adjacent to known high or extreme fire hazard (as identified by the *Salt Lake County Unified Fire Authority Wildfire Hazard Study* or other fire hazard studies) to conduct and provide to the City and UFA a similar assessment of their fire risk. Areas found to have high or extreme fire hazard ratings will be subject to the special design requirements of the *Utah Wildland-Urban Interface Code*. Proposed Utah State legislation would require counties (and potentially cities) to adopt a wildland fire ordinance in order to be eligible for financial and supervisory assistance from the state for fire suppression.

Herriman City is also coordinating with Camp Williams to create a firebreak between their property and new development adjacent to their property. The preferred location for this firebreak is along the Bonneville Shoreline trail. Camp Williams has produced maps of their fire patterns and risk levels, included in *Section 3.8 Military Activities*.

Figure 2: Wildfire Hazard



Source: Unified Fire Authority

3.1.4 Watershed protection

The foothills of the East Plan play an important watershed role in collecting and protecting runoff water that eventually reaches major water bodies and underground aquifers. This area is not part a designated Salt Lake County Watershed District, but the health of this foothill landscape still effects water quality. Parts of Rose Creek and Jordan River watersheds lie in the East Plan area. At 11.2 miles long, Rose Creek is one of the longest streams in the valley. The Jordan River is on the 303d list for Phosphorous and TDS and may be considered an “impacted water” as it exceeds their Total Maximum Daily Load for pollutants. A study is currently determining this and ways to improve its water quality. Any changes that increase erosion or pollutants reaching either waterbody must be mitigated.

Herriman City plans to adopt a *Stormwater Protection Plan* ordinance in 2009 to help limit the impacts to these streams through construction and other disturbances. This ordinance requires development projects to submit a plan for reducing impacts.

3.1.5 Erosion Hazard

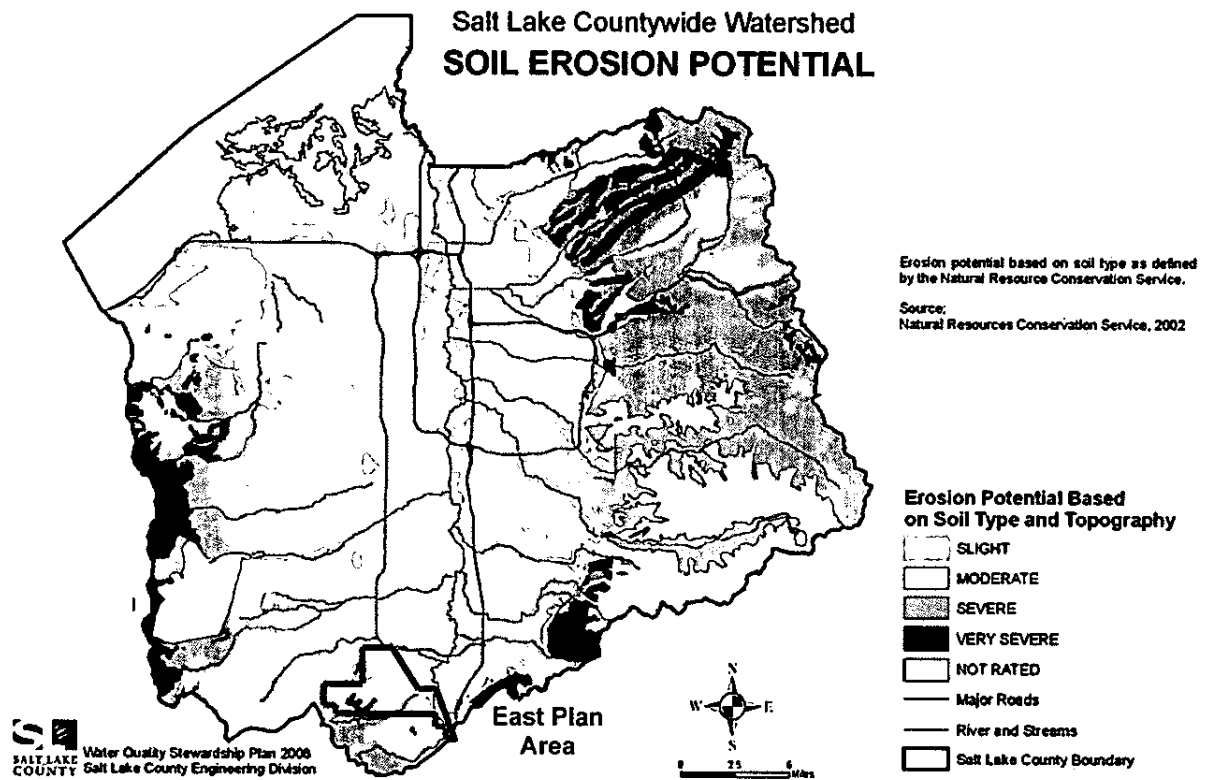
Erosion of existing soils is a threat to water quality and can undermine the overall stability of an entire developed area. Hillside areas are particularly vulnerable to long-term serious erosion impacts that can undermine buildings and roads, causing permanent damage and costly repairs. Erosion is a particular concern in combination with fire. As fire hazard in the foothills is moderate to severe at times of the year, Herriman City is cautious about erodible soils that could become a hazard after fire, rain or extreme grading.

The hillsides in the East Plan area generally have moderate to severe soil erosion potential with a few small spots with very severe potential, as shown in *Figure 3: Soil Erosion Potential*. The Natural Resources Conservation Service (NRCS) mapped the soils in Salt Lake County and developed an erosion hazard rating for each soil type (NRCS, 1974 and 2002). The rating presented in this section is the “hazard of off-road or off-trail erosion” as described in the National Forestry Handbook (NRCS, 2004). The erosion hazard rating is based on the slope and soil erodibility K-factor of a surface that has 50 to 75 percent of its area exposed by logging, grazing, mining, or other kinds of disturbance. The hazard categories are:

- Slight: Erosion is unlikely under ordinary climatic conditions.
- Moderate: Some erosion is likely and erosion-control measures may be needed.
- Severe: Erosion is very likely and erosion-control measures, including revegetation of bare areas, are advised.
- Very Severe: Significant erosion is expected, loss of soil productivity and offsite damage are likely, and erosion-control measures are costly and generally impractical.

Herriman City intends to prevent serious erosion problems by enforcing restrictions on steep slope development and applying necessary guidelines for grading and earthwork in moderate, severe and very severe erosion areas.

Figure 3: Soil Erosion Potential



3.1.5 Steep slopes and hillside protection

Herriman City restricts building on steep slopes to prevent dangerous erosion, excessive grading, impacts to the city’s viewshed and excessive infrastructure and maintenance costs. The city wishes to preserve the original landforms and natural appearance of these foothills to the greatest extent possible. Development should rest lightly and blend in with the existing hills and drainages. Mass grading, large cuts and fills, and development that significantly changes or hides the natural contours of these hillsides are not acceptable.

The slopes of most of the East Plan Area have been mapped in a Rosecrest/South Hills study (see *Figure 4: Steep Slopes*). This slope map will be updated by Herriman City when aerial imagery and topography is acquired in 2008. A slope map and other grading illustrations may be requested for all development within the East Plan Area to help the city understand the character of the development and its impacts on the natural topography.

Herriman City plans to adopt a Hillside Overlay Zone ordinance in 2009. This zone will apply to the East Plan area and will include hillside regulations found in the *Forestry Recreation* and *Resort Community* zones, as well as some additional standards. The Hillside Overlay Zone will include:

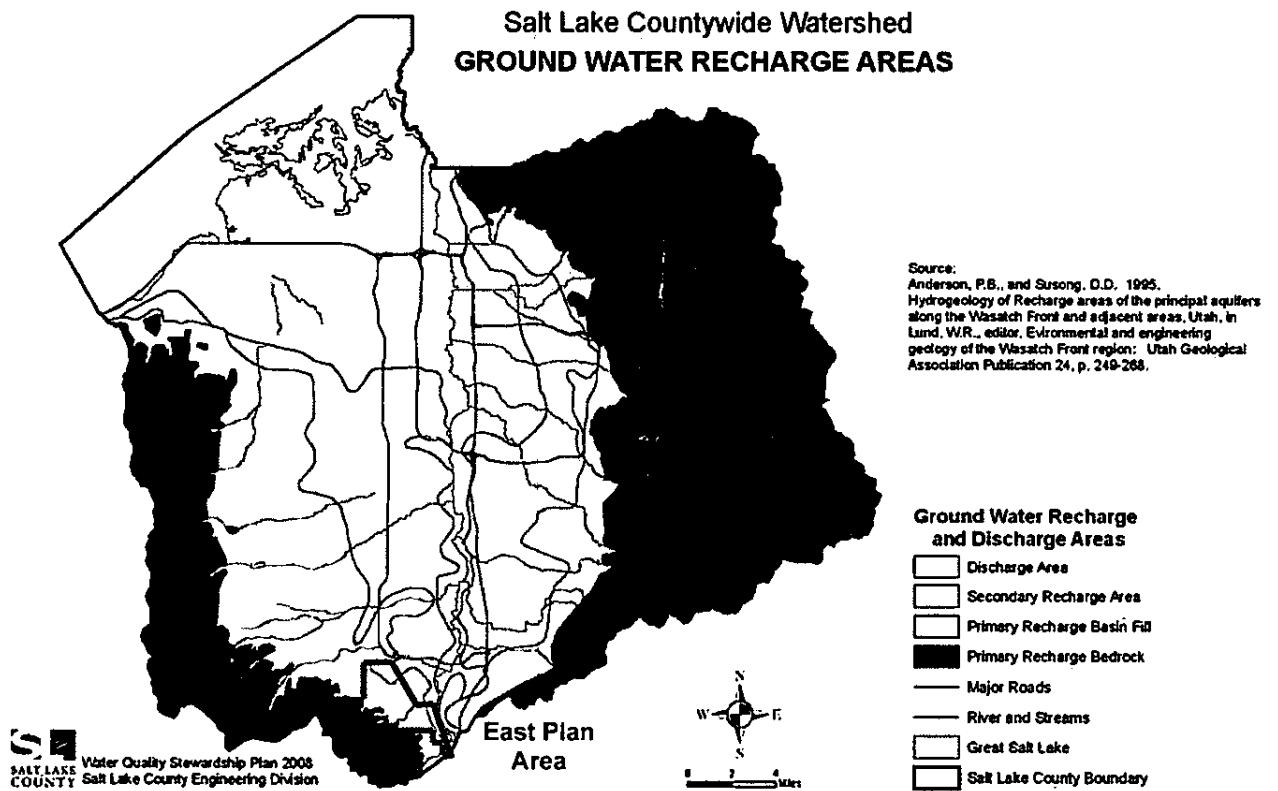
- Steep slopes – Prohibiting development on slopes greater than 30% and roads crossing grades greater than 30%. Requiring special site plan review by the Planning Commission for any construction on slopes between 20% and 30%.
- Grading and Drainage – Minimizing grading, preserving natural landforms and drainage and using native plants for revegetation.

- Limits of Disturbance – Establishing a maximum area within which all construction activity, including grading, must occur.
- Ridgeline Preservation – Preserving the natural appearance of key ridgelines when viewed from significant vantage points.
- Clustering, lot coverage and open space – Site development to encourage large stretches of open space and public access to it.
- Site plan approval – Special review and approval of site designs before issuing a building permit.

Figure 4: Steep Slopes



Figure 5: Ground Water Recharge Areas



3.2 Land Use Element

The East Plan Area runs from the foothills of Traverse Mountain West north and east onto the valley floor as it descends toward the Jordan River. It is the furthest southeast corner of Herriman City, bordered primarily by Bluffdale City and Camp Williams. The southern part of the East Parcel is perched on the foothills, graced by views of the Salt Lake Valley and both the Wasatch and Oquirrh Mountains. This area has immediate access to the open spaces of Traverse Mountain and is bordered to the south by unbuilt land used for military operations at Camp Williams. Several existing uses may be considered undesirable and require special buffering, including a water treatment plant and a large power substation on Redwood Road, as well as combat training areas at Camp Williams.

Currently, this area is quiet with little development. In the future, however, this area will be a bustling center of activity as Mountain View Corridor extends through this corner of the valley on its way to Utah County. As it passes through Herriman's East Plan Area, the city expects and supports two interchanges. The first is the Rosecrest Interchange at approximately 14500 South and the second is the Redwood Road interchange at approximately 16800 South). These areas can become regional commercial centers and gateways into the city.

Redwood Road and Bangerter Highway are the primary accesses and the only through streets today. Several new neighborhoods are planned, branching off from existing residential areas and roads. Rosecrest Road and Juniper Crest Road are existing roads to the west that are currently the primary connections to the East Plan Area. Redwood Road is planned to be the primary access to South Hills, and South Hills Blvd. will be the first connection to Redwood Road.

A mix of uses is proposed for these neighborhoods in order to create a well-rounded, self-sustaining community. Uses include single family residential, multi-family residential, commercial, mixed-use centers, parks and open space, schools and churches and public facilities/infrastructure. Herriman City considers each of these land uses important and critical to its future in building a balanced community. These land uses are described in more detail below and are laid out on Map 2: Land Use and in Table 3: Proposed Land Use.

Land Use	Acres (approx.)	% of total area	Max. dwelling units / acre	Max. dwelling units	% of total dwelling units
Hillside Residential	1,438	29.0%	1.5	2,156	10.6%
Low Density Residential	982	19.8%	2.5	2,454	12.1%
Medium Density Residential	778	15.7%	8	6,224	30.6%
High Density Residential	120	2.4%	20	2,393	11.8%
Mixed Use ¹	460	9.3%	15.4	7,088	34.9%
Commercial	202	4.1%	0	0	0
Business and Industrial Park	101	2.0%	0	0	0
Infrastructure and Utilities ²	475	9.6%	0	0	0
Military Operations	317	6.4%	0	0	0
Institutional ³	86	1.7%	0	0	0
Parks and Open Space ⁴	(1,368)	(27.6%)	0	0	0
Total⁵	4,958	100%		20,400	100.0%

Notes:

1. No maximum adopted, estimate of likely maximum is given. Minimum is based on 13 du/acres for 30% of site. Maximum is based on 22 du/acres for 70% of land in residential use. Includes roads (Mtn. View Corridor), public utilities (Water district).
3. Schools, churches, libraries, public safety. Includes only currently designated sites, but likely will have 200 additional acres.
4. Not included in total calculation. Parks and open space will be created from land zoned for other uses, but reserved as such.
5. Acreages are estimates only, and do not exactly add up to overall area.

3.2.1 Hillside Residential (0.5 to 1.5 du/acre)
Supply: approximately 1,354 acres, 27% of East Plan Area

Use: Large-lot residential with open space. May be located on hillsides, in environmentally sensitive areas, for resort/recreational areas and on buffer or fringe areas.

Goals:

- Cluster development onto part of site to protect sensitive resources, minimize footprint of construction, and buffer sensitive areas,
- Protect slopes over 30% by clustering homes onto more moderate slopes.
- Provide common or public access to open space or recreation resources.
- Linked open spaces to community wide open space and trail corridors.



Protect Herriman's assets, including its hillside viewsheds.



Protect hillsides by clustering development off sensitive slopes.



Example of hillside residential and golf course.

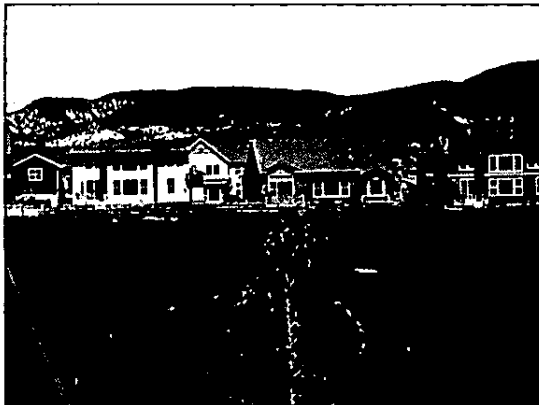
3.2.2 Low Density Residential (1.5 to 2.5 du/acre)

Supply: Approximately 1,066 acres, 22% of East Plan Area

Use: Large-lot residential. May be adjacent to environmentally sensitive areas.

Goals:

- Protect sensitive resources.
- Buffer other areas of low density.
- Encourage estate home development.
- Preserve minimum 20% of site as open space.
- Parks and open spaces linked to community wide open space and trail corridors.



Use cluster development to create community open spaces.

3.2.3 Medium Density Residential (2.5 to 8 du/acre)

Supply: Approximately 778 acres, 16% of East Plan Area

Use: Single family detached or attached residential.

Goals:

- Housing diversity and affordability.
- Provide land for supporting uses such as parks and recreation, schools, and churches.
- PUDs and HOAs are encouraged where appropriate.
- Preserve minimum 20% of site as open space.
- Parks and open spaces linked to community wide open space and trail corridors.



With ample open space, higher density development is attractive.



Unique architecture improves the quality of more dense development.

3.2.4 High Density Residential (8 to 20 du/acre)

Supply: Approximately 120 acres, 2.4% of East Plan Area

Use: Single family detached or attached residential and multi-family residential. May be adjacent to commercial, along high capacity traffic corridors.

Goals:

- Housing diversity and affordability.
- Attract residents of different life stages.
- Support active adult communities and other higher density lifestyle communities.
- PUDs and HOAs are encouraged where appropriate.
- Preserve minimum 20% of site as open space.
- Parks and open spaces linked to community wide open space and trail corridors.



Encourage single family townhomes to diversify the housing mix



Single family and multi-family housing can share the same street.



Multifamily housing should be attractive and complementary.



Multi-family housing can be designed to appear as a single residence.

3.2.6 Mixed Use (minimum 8 du/acre, no maximum)

Supply: Approximately 460 acres, 9% of East Plan Area

Use: Balanced combination of residential and commercial. Locate at areas with high accessibility and diversity of uses supported.

Goals:

- Higher density to support town center character and amenities.
- Higher density residential (9-30 du/acre) or office as transition areas in high impact areas and as buffer to commercial and highways.
- No more than 70% of area in residential to reserve land for commercial use.
- Multi-story buildings that may include ground floor retail and residential above.

- Provide public space such as plazas, parks, and entertainment centers.
- Support shared parking to increase walkability.
- Include enhanced streetscape, wide sidewalks, bike lanes and trails for a walkable community
- Potential transit center and transit-oriented development.
- Provide a variety of mixed-use community centers that include retail, commercial, housing, and community services.
- Promote walkable development and efficient infrastructure.
- Support future transit with uses and housing densities needed for transit-oriented development.



Combine commercial and residential in mixed-use projects



Create community centers with exciting public spaces.



Design mixed-use centers for walkability, bikeability and transit use.



Herriman plans to take advantage of transit investments to spur economic development.

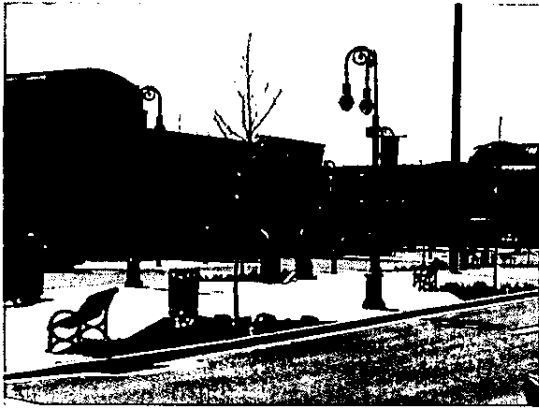
3.2.7 Retail and Commercial Office

Supply: Approximately 202 acres, 4% of East Plan Area

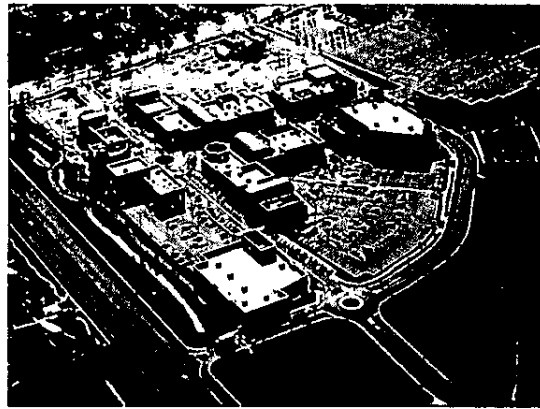
Use: Local and regional-serving retail, entertainment, professional offices, and public facilities. Located at significant traffic corridors/intersections; with ideal transportation access.

Goals:

- Commercial centers at a range of sizes – local-serving to regional attractions.
- Consumer goods and services.
- Entertainment offerings such as restaurants, theatres, and fun centers.
- Employment centers such as office parks, corporate buildings.
- Balance of jobs in the office, retail and service sectors.
- Higher intensity and multi-story development.
- Densities and designs to support future transit and transit-oriented development.
- Allow complementary signage that respects Herriman's character and viewsheds.



local, city-wide, and regional commercial centers.



A regional commercial center can balance Herriman's economy.

Support

3.2.8 Business and Industrial Park

Supply: Approximately 101 acres, 2% of East Plan Area

Use: Light industrial uses, incubator businesses, warehousing and distribution. Located at significant traffic corridors/intersections; with appropriate transportation access.

Goals:

- Provide support services to commercial areas.
- Employment center for assembly, distribution and logistics jobs to balance retail and service jobs.
- Provide location for businesses that support and complement Camp Williams military operations.
- Balance the city's economic base.
- Lower intensity development with infrastructure to support industry and distribution.
- Permit complementary that respects Herriman's character and viewsheds.



Employment centers can provide tax revenue and jobs close to home.



Industrial parks provide a good tax base and employment.

3.2.9 Infrastructure and Utilities

Supply: Approximately 475 acres, 10% of East Plan Area

Use: Utilities, roads, canals

Goals:

- Provide city services in a safe, efficient manner.
- Protect and buffer use to allow ongoing operations and future expansion as needed.
- Provide employment.



Public utility corridor

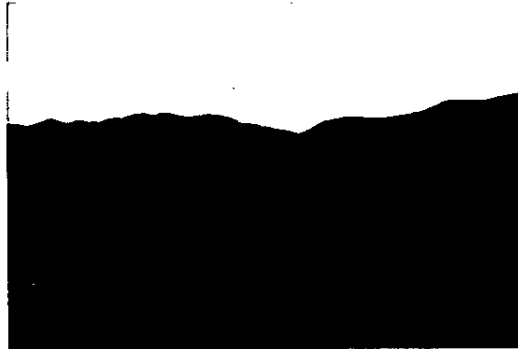
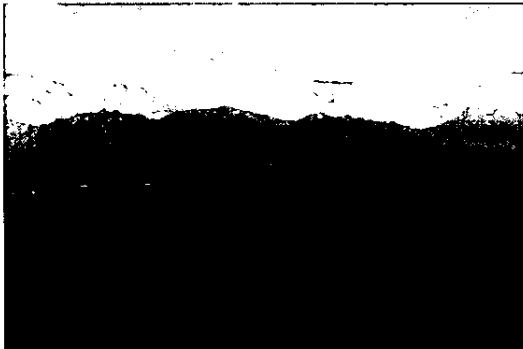
3.2.10 Military Activities

Supply: Approximately 317 acres, 7% of East Plan Area

Use: Military operations as determined by the US Department of Defense

Goals:

- Preserve the viability of military operations.
- Provide a buffer around Camp Williams.
- Protect humans from potential hazards that exist at Camp Williams.
- Protect natural areas from fire, erosion and other threats.



Some areas of open space character are in fact part of Camp Williams and have restricted access due to potential military hazards.

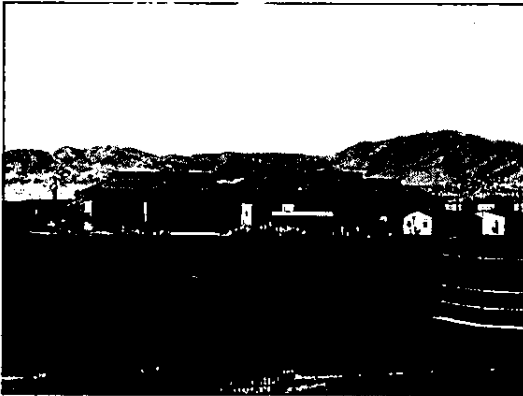
3.2.11 Institutions

Supply: Approximately 86 acres, 2% of East Plan Area. An additional 200 acres likely to be dedicated to this use as sites are provided within development areas.

Use: Schools, libraries, churches, police and fire stations as anchors of neighborhood life and activity

Goals:

- Provide community support services.
- Encourage civic activism.
- Architecture and site design that highlights the importance and public nature of these buildings and that is compatible with other civic buildings.
- High degree of accessibility to the community by central location, multi-modal transportation connections, and multipurpose facilities.
- Shared management and access to recreation between school district and city



Public schools may have a shared use agreement for Herriman residents to use their facilities outside of school hours.

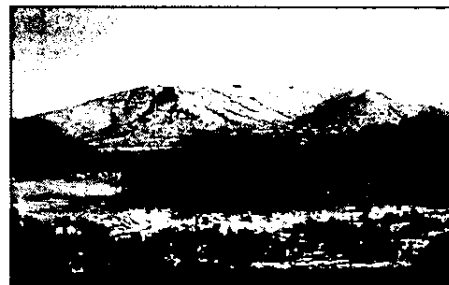
3.2.12 Parks and Open Space

Supply: Approximately 1,368 acres, 28% of East Plan Area (overlaid on other land use designations)

Use: Parks, recreation centers, natural and active open space, trails and resource protection areas.

Goals:

- Community recreation facilities, such as parks, recreation centers and trail corridors.
- Protection of environmentally sensitive areas.
- Permanently protected open space for both natural purposes and active recreation uses.
- Greenway corridors for preserving natural features and allowing trails connections.
- Permanent protection, public ownership and public access.
- Areas which may be developed in the future shall be zoned otherwise to be forthright about their potential future use.



Herriman parks serve a variety of users and interests and provide a public space for people to relax together. Herriman open spaces contribute to the character of the city and additional recreation.

3.3 Parks, Open Space and Trails Element

Recreation is a critical part of the healthy, active lifestyle Herriman wants to be known for. Quality recreation includes convenient locations, active and passive recreation, social interaction, family time, lifestyle, and healthy, active living. Herriman's goal is to develop a greenway system of parks, open space and trails that connect to the existing city system and to the regional network. Herriman City plans to create a recreation network so that all residents live within 1/4 mile of a public park or open space and live within 1/4 mile of a trail.

Herriman City currently does not have an adopted, city-wide Parks, Recreation Open Space and Trails Master Plan, but has a draft being prepared for adoption in 2008-2009, which should be followed as a guideline. To date, the City has negotiated the acquisition and construction of parks primarily through site plan approvals or development agreements with major property developers and through partnerships with Salt Lake County.

Herriman City also participated in the *Salt Lake County Southwest Regional Parks and Trails Master Plan (October 2007)* and will be reviewing this for official city adoption as well. This plan is heavily focused on implementing regional trails and major regional parks. For the East Plan area, it recommends constructing the Juniper Canyon Trail, Bonneville Shoreline Trail, Mountain View Corridor Trail and Welby Jacob Trail, and proposes a new large regional park in the southeast corner of the East Plan Area.

Herriman City has set a high standard for recreation and expects to continue this into the future. The City has adopted recreation standards for the East Plan Area as detailed in this chapter and summarized in *Table 4: Herriman City Standards Applied to East Plan Area*. The size of a park depends on its use and Herriman City wishes to maximize use of park land for active recreation purposes. Herriman City wishes to have as many large, multiple-use parks as possible to support its active, sports-oriented population, and to minimize maintenance on unused areas.

Table 4: Herriman City Parks and Recreation Standards applied to East Plan Area					
Type of Facility	Service area	Recommended standard	Recom. Number	Recommended Size	Recom. Total size
Community Park	1 mile radius	6 acres per 1,000 people	3 to 5	over 20 acres	180 acres
Neighborhood Park	½ mile radius	4 acres per 1,000 people	10 to 20	2 to 20 acres	120 acres
Local Park	¼ mile radius	as needed	as needed	up to 2 acres	as needed
Open Space	¼ mile radius (if no park nearby) otherwise, 1 mile	10 acres per 1,000 people	as needed	as needed	300 acres
Urban Trails	¼ to ½ mile radius	0.5 miles per 1,000 people	as needed	n/a	15 miles
Primitive Trails	½ to 1 mile radius	0.5 miles per 1,000 people	as needed	n/a	15 miles
Bike Routes	¼ to ½ mile radius	As needed	as needed	n/a	as needed

Note: Based on population of 30,000. All numbers are approximate and represent minimum recommendations.

3.3.1 Parks

Herriman currently provides 8.1 acres of parks per 1,000 residents. The National Recreation and Parks Association (NRPA) recommends providing 6.25 to 10.5 acres of parks per 1,000 people, and a similar amount of open space. This amount should adjust based on community preferences, lifestyle and demographics. Considering Herriman's young population and desire to promote a healthy, active lifestyle, the city is striving for 10 acres of parks and 10 acres of open space per 1,000 people. Thus for the East Plan Area, with a new population of 20,000 to 50,000 people, Herriman anticipates at least 200 to 500 acres of developed parks and 200 to 500 acres of open space. This amounts to approximately 8% to 20% of the East Plan Area's land in parks and open space. In existing parts of Herriman City, parks and open space (both city and county) make up approximately 11.6% of the land area.

The city encourages constructing sports fields to serve its growing youth sports leagues, but they need to have adequate support facilities. Currently, Herriman provides most facilities up to national recommendations, but is still unable to keep up with demand for baseball and soccer fields, so is setting a higher standard for those facilities. The recommended number of recreation fields, courts and amenities are shown in *Table 5: Recommended Recreation Facilities*.

	NRPA service radius	NRPA Recommended Standard (1 per population of)	Herriman Desired Standard (1 per population of)	Recommended supply for East Plan Area ¹	Total acreage recommended (approximate, including parking and support facilities)
Softball/Baseball	¼ - ½ mile	5,000	2,500	12	36
Soccer/Lacrosse ²	1-2 miles	5,000	2,500	12	36
Football	15-30 min travel	20,000	10,000	3	10
Indoor Basketball ³	1-2 miles	5,000	5,000	6	2.5
Basketball	1-2 miles	5,000	5,000	6	2.5
Indoor Tennis ³	1-2 miles	2,000	2,000	15	5
Tennis	1-2 miles	2,000	2,000	15	5
Indoor Volleyball ³	1-2 miles	5,000	5,000	6	1.5
Volleyball	1-2 miles	5,000	5,000	6	1.5
Indoor Pools ³	1-2 miles	20,000	20,000	1.5	3.5
Swimming Pools	20,000	20,000	15-30 min travel	1.5	3.5
Golf	50,000	50,000	30-60 min travel	0.6	100
Skate Park	50,000	50,000	2-3 miles	0.6	1
Total					208

Notes:

¹Based on estimated population of 30,000.

² Some soccer fields accommodate football, others are only sized for soccer and lacrosse.

³Indoor and outdoor facilities for the same sport should be provided separately to the same standard because seasons of use do not overlap. Most outdoor facilities are not used in the winter months.

Parks that are privately-owned or that require an admission fee purpose are not considered city parks. However, parks, pools and recreation facilities owned by Homeowners Associations and used by members who are Herriman residents are sometimes counted toward city park requirements. Schools, churches and other public facilities that supplement recreation needs are discussed here, but are not considered city parks.

Herriman City prefers to have large, usable park spaces instead of small strips of open space with limited function. Facilities that have dual purposes, such as detention basins, may be counted as parks provided the public has free access to them and recreation is a primary purpose of them. To conserve water, irrigated areas should be designed into large

clusters to allow for grassy play areas, instead of small strips of unusable space. Small strips, fringe areas, and natural buffers should be planted with native and drought-tolerant vegetation to minimize irrigation and maintenance. Parks with sports fields should include at least two sports fields, as well as parking and restrooms to suit in order to reduce traffic impacts and conflicts with neighbors. Where space allows, medium and large playgrounds should be designed with a picnic pavilion adjacent to it.

Schools and Churches

Other quasi-public facilities, such as schools and churches also provide a recreation benefit, but are not considered city parks. Through a joint-use agreement, Herriman City and Jordan School District have offered residents limited use of school facilities. The schools that are proposed in the East Plan Area are shown in *Table 6: Quasi-Public Recreation Facilities* in Herriman. Jordan School District owns a 76.84 acre parcel in the East Plan Area planned for some school purpose, but is not included because it has not yet been determined.

According to Jordan School District, approximately 50% of total school site is used for recreation. The District is amenable to working with Herriman City to jointly schedule and maintain school sites to make them more available to the public during non-school hours. The typical school site available to recreation is:

- Elementary School: 6 acres (1-2 fields)
- Middle School: 12 acres (3-4 fields)
- High School: 0 acres (may have over 20 acres in recreation, but for student use only)

Name of Facility	Use	Recreation Acreage (estimate)
South Hills Elementary School	Playground and play fields open to public during non-school hours.	6 acres
Future Elementary Schools (3)	Playground and play fields open to public during non-school hours.	18 acres
Future Middle Schools (1)	Sports field use limited to students. Track open to public use when available.	12 acres
Total		36 acres

3.3.2 Open space

Open space serves a variety of public health, safety and welfare goals. Open space is often a byproduct of development as areas that are difficult or not sensible to develop become protected. On the other hand, open space is often designated to proactively protect places in the community that are intrinsically valuable and that the community would be disappointed to lose to development.

Herriman City has defined some of the types of lands that are good candidates for open space protection because they are sensitive environmentally, intrinsically valuable to Herriman residents, or pose hazards to human life if developed, (see draft *Herriman City Parks, Recreation, Open Space and Trails Master Plan*). Environmentally sensitive areas are more fully defined in *Chapter 3.1 Environmental Element*. Open Space areas are discussed in *Chapter 3.2 Land Use Element* and more fully defined here. Herriman City wishes to preserve open space at two distinct levels of protection:

1. natural open space for the primary purpose of protecting natural resources, and
2. active open space to serve multiple use purposes including protection as well as recreation, infrastructure and other city needs.

Herriman City is striving for 10 acres of open space per 1,000 people in addition to its parks. Thus for the East Plan Area, Herriman anticipates at least 200 to 400 acres of open space, which is approximately 6% to 12% of the land in the

East Plan Area. The general framework for the open space system in the East Plan Area is shown on *Map 3: Open Space and Trails*. The Open Space system for the East Plan Area should include:

- Drainages – Juniper Canyon, Wood Hollow, Porter Rockwell Drainage, Beef Hollow, and Un-named Drainage.
- Canals – Welby Jacob Canal
- Infrastructure – Mountain View Corridor buffer, powerline corridor
- Hillside and geologic – 30% slope areas
- Hazards – Camp Williams buffer
- Viewshed area – Slopes above development

Open space may be protected in a number of ways. It may be dedicated to the City through the development process as part of the agreement to permit higher density development elsewhere and protect sensitive lands. It may also be purchased, in fee title, or as a conservation easement to permanently remove the development rights. Several organizations help communities buy and protect open space, including the Salt Lake County Open Space Trust Fund that provides a 50% match for purchasing permanently protected open space. Herriman City is currently identifying properties that may be suitable for an open space purchase for public benefit, both in the East Plan Area and within and adjacent to the rest of the city.

3.3.3 Trails

Trails have become a critical part of community recreation and transportation systems. Trails help promote walking and biking as a healthy alternative transportation mode and increase the safety of these modes. Many communities today have a major, interdepartmental focus on trail construction. Communities that are not yet built out have the distinct advantage of locating their trails system before development goes in, rather than struggling to retrofit one. Herriman City plans to make their trail as extensive as possible now to eliminate the need to retrofit later. Existing areas of the city have extensive trails networks, at the neighborhood scale as well as city-wide. Herriman City also plans to protect as wide a corridor as possible to reduce impacts on neighbors and create a pleasant recreation experience. The recommended minimum width for major (regional) trail corridor is 100' wide, while minor (local) trail corridor should be minimum 30' wide.

NRPA recommends 0.5 miles of trails per 1,000 residents. The current ratio of existing trails in Herriman is 0.6 miles per 1,000 residents. Because Herriman is an outdoor-oriented community, this plan recommends 0.5 miles of primitive, unpaved trails in addition to 0.5 miles of urban, paved trails per 1,000 residents. Herriman City plans to provide different types of trails for different users. The different trail types proposed support trail users of different interests, modes of travel and abilities. Thus, the City expects a comprehensive system that includes urban trails, primitive trails and bike routes. The rough locations of trails proposed in the East Plan Area are shown on *Map 3: Open Space and Trails*, but are subject to change based on development approvals.

Four major regional trails are present in the East Plan Area— Bonneville Shoreline Trail, Juniper Canyon Trail, Welby Jacob Trail, and East Herriman Trail. Specific alignments of these trails are shown in *Salt Lake County Southwest Regional Parks and Trails Master Plan*. These trails merit special attention as the city intends to make them a major focus of the open space and trail system. Guidelines for the design of these trails are included here.

1. Regional Trail - Bonneville Shoreline Trail (BST)

Supply and Size: Approximately 4.0 mile long primitive trail, included in *Primitive Trails*

Service radius: Salt Lake region, connected to other segments of the regional trail

Purpose and Use:

- Herriman City supports the development of the Bonneville Shoreline Trail in cooperation with Salt Lake County, Camp Williams, the Bonneville Shoreline Trail Coalition and other trail advocates.
- The trail should be publicly owned and permanently protected.
- The trail is a multi-purpose trail for equestrian, hiking, and mountain biking. Motorized use is not permitted.
- The preferred alignment in Herriman should be in a natural corridor, separate from a road or sidewalk and avoids crossing roads.

- The preferred alignment in Herriman should be located at the upper limit of development for a continuous corridor with public access.
- The preferred alignment in Herriman should provide a firebreak and/or fire access between Camp Williams and adjacent development. Minimum 100', preferably ¼ mile.
- A preferred alignment has been proposed in Herriman after identifying a route on the ground and mapping it with a GPS system.
 - Comply with Salt Lake County BST Development Standards for location, use, design, grading, and slopes, as outlined in the *Bonneville Shoreline Trail Alignment Plan for Salt Lake County* (January 2005). Applicable sections are summarized below:
 - The BST is a pathway on the west slopes of the Wasatch Range and the east slopes of the Oquirrh Range, on or near the shoreline bench of ancient glacial Lake Bonneville (generally 5,200'). It includes a north-south alignment on each side of the valley and an east-west connection to the Provo/Jordan River Parkway, Camp Williams, and Yellow Fork County Park.
 - The BST is the trunk of a branching regional system of trails linking city sidewalks to wilderness mountaintops.
 - The trail should skirt the developed areas of the Wasatch Front, often forming the boundary between urban subdivisions and National Forest (*or other public lands*).
 - The preferred route is for use by the county, municipalities, planners and developers should guide residential and commercial development, avoid unnecessary conflicts with development, and encourage government and volunteer groups to construct a regional trail.
 - Topography and existing land use restrictions, like Watershed and Wilderness, will restrict the use of the trail more than the construction or surface type.
 - The BST will be a pathway separated from streets and paved roads and located within the natural landscape.
 - The preferred route takes advantage of existing trails, mine roads, and animal paths where they fall within the feasible trail route and where they provide the most convenient use of the topography to reduce the environmental impact and make construction easier.
 - Occasionally, the BST will use a low-maintenance, unpaved road, such as water tank access roads, as a means to link primitive trail segments.
 - The BST may capture existing primitive trails for use as its primary route, such as the Rattlesnake Gulch Trail, that will fall outside the BST standard because of steep grades or surfacing material.
 - BST "connectors" are intended to link sections of developed primitive trail.

Design:

- Design should follow the guidelines of the *Bonneville Shoreline Trail Alignment Plan for Salt Lake County* (January 2005). Applicable sections are summarized below:
 - The BST standard will be a primitive trail.
 - All of the trail will be open to pedestrian use, and portions of the trail will accommodate mountain bikes and equestrian use where feasible and permitted.
 - The trail should follow land contours, avoiding steep grade changes.
 - The trail corridor should provide a buffer of both lateral distance and elevation between the trail and existing development (where possible). Buffer provides privacy for residences and a natural experience for trail users. The route may be located on smaller benches and ridges between 5,400' and 6,000' to provide this buffer and avoid steep slopes.
 - The BST trail construction standard follows principles developed by the International Mountain Bike Association (IMBA) for multipurpose trails. Such variations for standard construction are necessary, when feasible alternative routing does not exist.
 - Trail tread should average about three feet wide. Horizontal brush clearance should be about four feet from the trail centerline.
 - Vertical clearance should be about ten feet to allow for mounted equestrian users.
 - Gradient should be maintained within zero to ten percent, with short sections allowed to rise to fifteen percent.
 - Long, gradual ramps and climbing turns are preferable to switchbacks.

- Full bench design, which requires the full width of the trail tread to be cut into the hillside. Trail profile and trail grading should prevent erosion (see IMBA guidelines).

2. Regional Trails –Juniper Canyon Trail, Welby Jacob Trail, and East Herriman Trail

Supply and Size: Approximately 7 miles total

Service radius: Southwest Valley, connected to other segments of the regional trail

Purpose and Use:

- Major regional connection trails.
- The trails should be publicly owned and permanently protected.
- The trails are multi-purpose trail for equestrian, hiking, and mountain biking. Motorized use is not permitted.
- The trails should be located in natural corridors, separate from a road or sidewalk and avoids crossing roads.

Design:

- Paved trail with shoulders, separated from adjacent roads.
- Ramps, mild grades and other features designed for maximum accessibility.
- Minimum trail width 16', minimum corridor width 100'.

3.3.5 Recreation Funding

Herriman City ordinance requires a portion of land in all new planned unit developments (typically 20%) be reserved as open space. The City often requires through development agreements that some park features and amenities be constructed as part of a dedicated open space. The recreation expectations set by this recreation chapter and the draft *Herriman City Parks, Trails and Open Space Master Plan* can be met by the minimum required amount of land dedicated. However, the minimum requirements are often not fulfilled as some open space land that is unsuited for parks and recreation is dedicated to the city. Acquiring park land and building parks is a partnership between the city and new developments. Herriman City will pursue other partnership methods with new developments to fulfill its parks expectations if minimum parks needs are not met by the open space requirements.

For projects that are smaller than 15 acres, Herriman City plans to establish an impact fee in lieu of park and land dedication. This way, the City can achieve its goal of larger parks with more amenities. Herriman City currently has a parks and recreation impact fee that will be revised through a parks impact fee study to be conducted in 2008. This study will also propose the Capital Improvements Plan budget for the next 5 years. The impact fee per dwelling is likely to double from the current amount.

3.4 Institutions

3.4.1 Schools

Based on a proposed new population of the East Plan Area and its young demographic makeup, there is demand for several new schools, as shown in *Table 7: New School Demand in East Plan Area*. Some schools boundaries may cross city boundaries and not be located within the East Plan area.

Type	Serves	Number needed	Acres per school site	Total acres
Elementary	2,250 households	5.8	12	69.6
Middle School	9,000 households	1.4	25	35
High School	18,000 households	.72	55	39.6
Total		7.92		144.2

Notes: All numbers are based on proposed population of 13,000 households. Numbers are left fractional, but will be rounded up as needed based on facilities provided regionally.

Source: John Taylor, Jordan School District.

Currently, Herriman has 2 elementary schools (Butterfield Canyon and Herriman) and 1 middle school (Ft. Herriman). A new high school will be under construction at 11800 South 6000 West (Pioneer St.), which will serve parts of Herriman and South Jordan. When complete, the proposed middle and high school sites in the East Plan Area will likely serve other parts of Herriman and Bluffdale as well. The 75-acre parcel owned by the school district in the East Plan Area will likely become a middle school site. Herriman City has been proactive in helping the local school district acquire school sites.

3.4.2 Churches

This area of Salt Lake County has a strong membership in the Church of Jesus Christ of Latter Day Saints and the Church has plans for numerous facilities to serve members in the East Plan Area. The LDS Church typically plans one ward chapel per 500 households, and one stake center per 6 to 8 wards. Based on a proposed 30,000 residents in the East Plan Area, there will likely need to be approximately 20 new ward chapels and 2 new stake centers. Typical areas for these facilities are 4 acres for a chapel and 5 acres for a stake center, translating to approximately 90 acres of land devoted to LDS church facilities in the East Plan Area.

Other faiths that have not acquired property East Plan Area, but are likely to do so include the Catholic Diocese.

3.5 Transportation Element

An efficient transportation network is the result of an orderly, well-connected system and a variety of modes of travel. Herriman City plans to build its transportation network based not only on roads, but on transit, bicycles and pedestrians as well. Herriman City also plans to integrate its transportation planning with its land use planning so that the transportation truly serves the land use desired, instead of driving land uses that were not anticipated. Thus, the land uses proposed take advantage of major infrastructure proposals for the Mountain View Corridor highway and for future transit leading from the West Jordan spur.

The guiding principles of the *Herriman City Transportation Master Plan, 2007* should be followed when making transportation decisions. This area was not yet annexed when this plan was complete, thus is not specifically considered, but the guiding principles still apply:

- Provide safe and efficient mobility to protect and enhance Herriman's quality of life.
- Maximize transportation connectivity.
- Use access management tools to maximize roadway efficiency.
- Follow Herriman City standard roadway designs to integrate with the existing network.
- Encourage transportation alternatives that reduce the impact on the environment.
- Incorporate bicycle routes and trails into new street designs or into segregated facilities.
- Integrate with regional plans for public transportation.
- Design for full accessibility in all street, sidewalk and trail designs.
- Partner with local, state and federal funding sources.

Herriman City's Transportation Master Plan recommends all residential proposals over 50 units and commercial proposals over 50,000 square feet require a traffic impact study. The full extent of transportation needs of the East Plan Area and its impact on other parts must be addressed comprehensively, in a manner more extensive than a simple traffic impact study. A supplemental study to the *Herriman City Transportation Master Plan, 2007* will be undertaken for the East Plan Area in 2008. This study should include discussions of the following:

- Existing and Proposed Roadway System
- Existing and Proposed Traffic Volumes
- Existing and Proposed Intersection Improvements
- Existing and Proposed LOS Conditions
- Existing and Proposed Transit System
- Existing and Proposed Trails and Bike Paths
- Standard Road cross-sections
- Standard Trail cross-sections

This plan recommends sizing infrastructure for the highest population number anticipated in this plan, to ensure capacity is sufficient for a likely acceleration in future growth. This plan proposes population densities and overall numbers that are higher than the estimates used in the *Herriman City Transportation Master Plan (2007)*. For areas where traffic from the East Plan Area flows into the areas included in the Transportation Master Plan, potential impacts and infrastructure increases shall be considered.

3.5.1 Roadways

Herriman City plans to build a road network to support a diversity of land uses, with road designs tailored to meet the unique needs of each land use. As Herriman City wishes to expand its commercial and industrial base, lands adjacent to major transportation infrastructure should be designed to make the most of these investments. Where Herriman City plans to locate residential housing, roads should serve the multimodal needs of local residents.

Herriman City encourages roads that maximize both transportation efficiency and livability for neighbors, bikes and pedestrians. Traffic calming principles are encouraged, including:

- Sizing of roads to the minimum width needed to accommodate traffic and parking as needed.

- Wide park strips to support healthy street trees and buffer people from the road.
- On-street parking where appropriate to provide an additional buffer.
- Curb bulb-outs as needed to shorten pedestrian crossings and slow cars making turns.
- Planted street medians to shorten pedestrian crossings, create “side friction” and enhance the streetscape.
- On-street bike routes where appropriate to mix modes of travel and slow cars down.
- Sizing of roads must also consider the terrain covered. Steep terrain may require significant road cuts and special consideration.

Access management should be used to increase traffic efficiency. Access management smooths traffic flow by reducing the number of curb cuts and encouraging turns in more limited locations. This also permits more established pedestrian crossings at major turn areas. Access management is suggested for major arterials and should be discussed in detail in the *East Herriman Transportation Master Plan* to be completed in 2008.

Major roadway connections need to be planned in coordination with adjacent cities and with UDOT. For the East Plan Area, major coordination projects mentioned in the *Herriman City Transportation Master Plan (2007)* include:

- a. Mountain View Corridor alignment, frontage road, crossings and interchanges.
- b. Alternate Mountain View Corridor alignment through the East Plan Area, proposed by Herriman City and currently undergoing UDOT engineering review.
- c. Continue 14600 South St. and 4800 West St. to the Mountain View Corridor interchange at about 15000 South to facilitate south-travelling traffic into Herriman.
- d. Preserve intersections on Bangerter heading through Bluffdale for better access.
- e. Establish a new intersection at 5100 West 14300 South

3.5.2 Transit

Herriman City is currently served by one Utah Transit Authority (UTA) bus route, which travels west from I-15 at 10400 South to Herriman along 13400 and into Rosecrest. Another nearby route serves Riverton from Redwood Rd. Herriman City, Riverton City and Bluffdale City recently discontinued a van shuttle service to the Sandy TRAX station due to low ridership.

As the city grows, Herriman expects transit service to expand and is promoting land use densities in several key locations where transit is likely to locate to encourage increased transit service and ridership. Herriman City is also proposing transit centers and Park-and-Rides to accompany stops and wishes to establish a major transit station and transit-oriented development to take advantage of the Mid-Jordan Light Rail Transit Line. Herriman city proposes establishing an express bus service here until Herriman has the population densities to justify Light Rail Transit.

3.5.3 Bicycles and pedestrians

Bicycling and walking are alternative modes of travel that Herriman City promotes. Streets, trails and sidewalks should be designed for full ADA accessibility and to fully integrate with other modes of travel in the city. Sidewalks should be designed to be comfortable for two people walking side-by-side (minimum 5').

Major trails planned for Herriman City and the East Plan Area are described in Chapter 3.3.3 Trails, in the draft *Herriman City Parks, Recreation, Open Space and Trails Master Plan* and in further detail in the *Far Southwest County Trails and Parks Master Plan* (Salt Lake County, October 2007). These trails should be designed to the standards described in the *Far Southwest Plan*. Herriman City needs to develop a bike route master plan to encourage commuter cyclists who are not inclined to travel on the trail system.

3.5.4 Streetscape

As roads make up a large percentage of the public realm in any community, Herriman City wants them to meet the same high standards as the rest of their public spaces. Herriman has a standard fixture and spacing for street lighting, benches, street trees and sidewalks that should be met on all public streets that are outlined in the City's *Commercial, High Density and Medium Density Design Guidelines* and in city ordinances. Streetscape in the East Plan Area should reflect the unique surrounding landscape in areas where reflecting and enhancing the natural environment are desired.

3.6 Public Services

The public services provided to residents and businesses in the East Plan area are referenced and summarized here. More detailed summaries and maps of each public service are included in the appendix. The full reports for each service are available from Herriman City.

3.6.1 Water supply and Secondary Water

Culinary and Secondary irrigation water will be provided to this area by Herriman City and their water supply. The details of these systems are outlined in the following plans:

Culinary Water Master Plan – October 17, 2007 & Revised December 17, 2007

Secondary Water Master Plan – December 17, 2007

Herriman City encourages water conservation. Herriman City's landscape ordinance has provisions to encourage xeriscape and efficient irrigation. Herriman City's building code requires low flow plumbing. Secondary water is provided to the majority of the East Plan area to use for outdoor irrigation to conserve treated water for culinary purposes. New development in the East Plan area will be required to include the necessary infrastructure to support secondary water delivery and use.

3.6.2 Storm Drainage

Storm drainage for the East Plan area will be connected to the Herriman City's stormwater system. The design, cost and funding for this system will be outlined in an *East Herriman Storm Drainage Study* to be completed in 2008.

Herriman City encourages retaining stormwater as close as possible to its source to allow it to percolate into the ground, rather than running off into stormwater sewers. This is achieved through stormwater detention basins, and directing runoff into bioretention swales, and existing drainage corridors.

Herriman City plans to adopt a *Stormwater Protection Plan Ordinance* in 2009 to help limit construction impacts on the quality of water runoff entering public waters. This ordinance will apply to the East Plan Area.

3.6.3 Sewer

South Valley Sewer District currently operates a major power sewer treatment plant in the East Plan Area. Sewer treatment in the East Plan Area will be provided by South Valley Sewer District and the existing plant is expected to expand to accommodate the additional demand of development. The design, cost and funding for this system will be outlined in an *East Herriman Sewer Study* to be completed in 2008.

3.6.4 Electricity and Natural Gas

In the East Plan Area, electrical power will be provided by Rocky Mountain Power and natural gas will be provided by Questar. The design, cost and funding for these systems will be outlined in an *East Herriman Utility Study* to be completed in 2008.

Rocky Mountain Power currently operates a major power substation in the East Plan Area. They have plans to build a major power transmission line through Herriman. Two alternative alignments for this transmission line include either paralleling Mountain View Corridor on its east side or along Welby Jacob Canal. Development in the East Plan Area must adapt to the proposed utility corridor.

Kern River gas has a major underground gas line passing through the East Plan Area. Development in the East Plan Area must respect this utility corridor.

This part of the valley also has potential to generate wind power. Camp Williams has a wind turbine generator on its property near the Jordan River narrows. The potential for additional wind turbine generators has not been studied in

Herriman, but is a possibility for the Traverse Mountain ridge in the East Plan Area. Herriman City could eventually become a power provider to its residents and plans to study this possibility in the future.

3.6.5 Solid waste

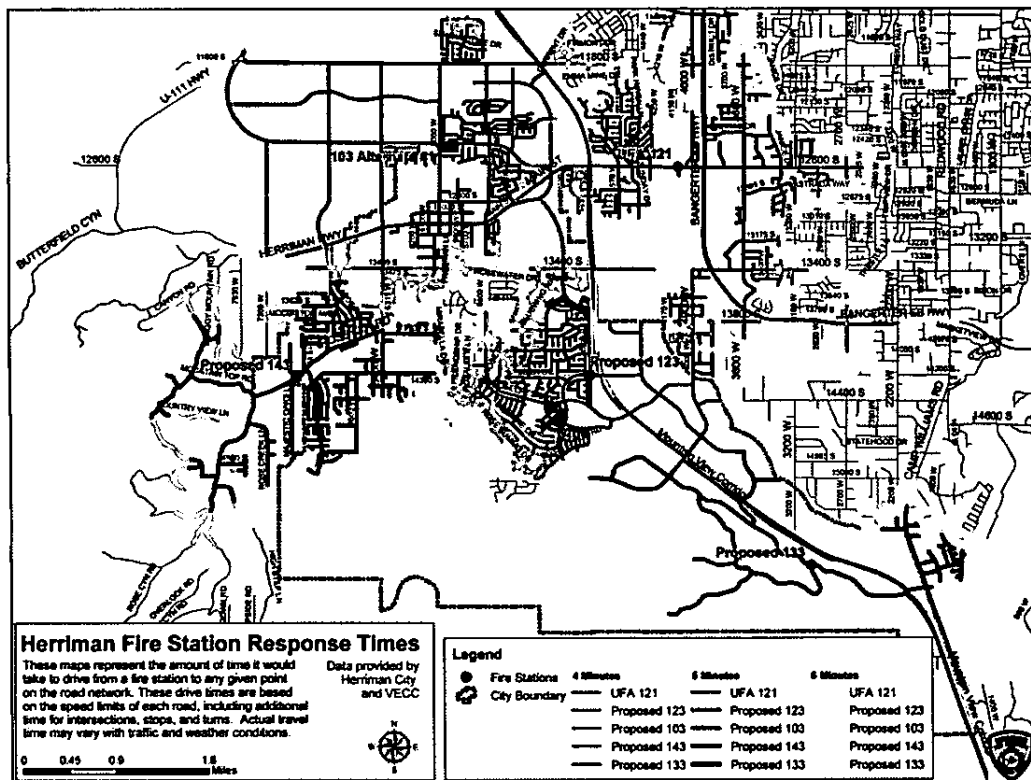
Trash and recycling pickup will be provided in this area by Salt Lake County Waste Management.

3.6.6 Fire and Police

Fire and police service will expand to ensure the safety of residents and businesses in this area. In addition, the city needs to deal with brush fires and the urban-wildland interface. Fire protection and emergency medical services (paramedics) are provided to Herriman City by Unified Fire Authority and will expand to cover the East Plan Area. Typically, the land for new stations is provided by the city (or developer) and the station is built by the fire department. Future stations will be paid for through bonds undertaken by the Unified Fire Authority.

The locations of fire and police stations will be determined by special study before final approval will be given to new development in the East Plan Area. Fire stations serve a response-time radius of approximately 2 miles. A new station will open in the East Plan Area near the intersection of Rosecrest Road and Mt. Ogden Peak Rd. in 2008. Two additional stations are anticipated for the East Plan Area – one at the southeast corner of the area and one on the Laguna/Malibu ridgetop. Provisions are being made to accommodate wildland firefighting within one new station in Herriman and a higher-level training, rescue or hazardous materials center. Police and fire station coverage is shown in *Figure 6: Police and fire station service areas*.

Figure 6: Police and fire station service areas.



Source: Herriman City and United Fire Authority

Police service will be provided by Salt Lake County Sheriff, as it is for the rest of Herriman City. According to a standard of 0.88 deputy per one 1,000 population, it is expected that the East Plan Area will need at least 26 additional officers. Herriman's main police station will be located at the new city building in the North Plan area. Additional police

facilities will likely be substations located within fire stations. Herriman City may develop its own police force in the future.

3.7 Economic Element

Herriman City is planning to develop its first *Economic Development Master Plan* in 2008. Development proposals for the East Plan Area should help Herriman City achieve its economic goals for the long term. The *Economic Development Master Plan* should address the following areas:

1. Moderate Income Housing Element
2. Employment Goals
 - a. Types of jobs desired
 - b. Possible business clusters
 - c. Jobs to Households Goal
 - i. A common suburban goal of and 1 job per 2 households would yield approximately 5,000 jobs for an eventual population of 10,000 households,
3. Industrial Use Goals
 - a. Types of industries desired
 - b. City revenue goal generated from this land use
 - c. Square footage goal for this land use to generate desired city revenues
 - d. Infrastructure needed to support this use
4. Commercial Use Goals
 - a. Commercial leakage study for retail spending outside of Herriman City
 - b. Types of commercial desired
 - c. City revenue goal generated from this land use
 - d. Square footage goal for this land use to generate desired city revenues
 - e. Infrastructure needed to support this use
 - f. Timing and phasing of associated housing and infrastructure
 - g. Relationship to transit

3.8 Military Activities

Herriman City borders Camp Williams, a military facility owned and managed by the United States Department of Defense and currently operated by the Utah Army National Guard. Herriman City supports ongoing operations of this important military base. Herriman City intends to cooperate with Camp Williams in managing their border and supporting compatible uses along this border. Herriman City also intends to protect the safety and welfare of residents and the general public by supporting an appropriate buffer and safety measures for lands within this zone.

Activities here may include, but are not limited to: training of military personnel in combat, emergency response and other military operations; weapons deployment; helicopter, tank and large machinery operation; and other activities as determined by the Department of Defense. Activities may have adverse impacts including, but not limited to: excess noise, light, and dust.

Camp Williams has special circumstances that should be addressed through a specific zone and design guidelines. Federal regulations supercede local ordinances and regulations. Thus, this land use designation has been established to identify this area, not to impose local regulations upon it. Herriman City plans to draft and adopt a zoning designation for this area. This designation should include:

- a. The planning context – unique issues that need to be known
- b. Federal regulations that apply to Camp Williams that could impact this zone
- c. Open Space setback or buffer, preferably 1320 feet (1/4 mile) as fire break and safety zone, as per Camp Williams recommendations.
- d. FireWise 2000 vegetation designs, as per Camp Williams recommendations.
- e. Fencing, as per Camp Williams recommendations.
- f. Notice placed on plat maps indicating proximity to training, impact or weapons ranges, as per Camp Williams recommendations.
- g. Other considerations:
 - i. goat breaks,
 - ii. emergency egress roads (not Standard Operating Procedure)
 - iii. noise impacts, (as shown in Figures 6 and 7 that follow)
 - iv. aviation corridors and associated zoning
 - v. fire threat and fire history
 - vi. habitat, wildlife, vegetation and proposed wildlife crossing locations
 - vii. cultural sites
 - viii. trails
 - ix. well location
 - x. windmill locations

Figure 7: Estimated Noise Levels from Artillery impacts at Camp Williams

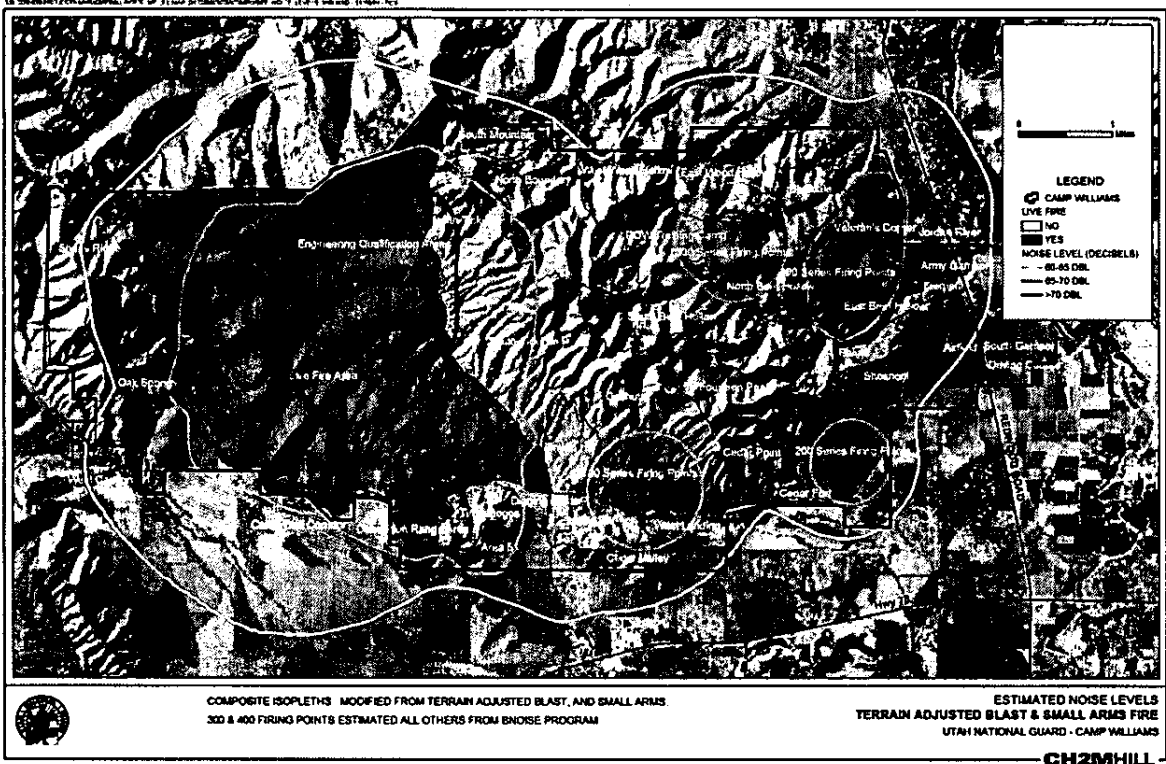
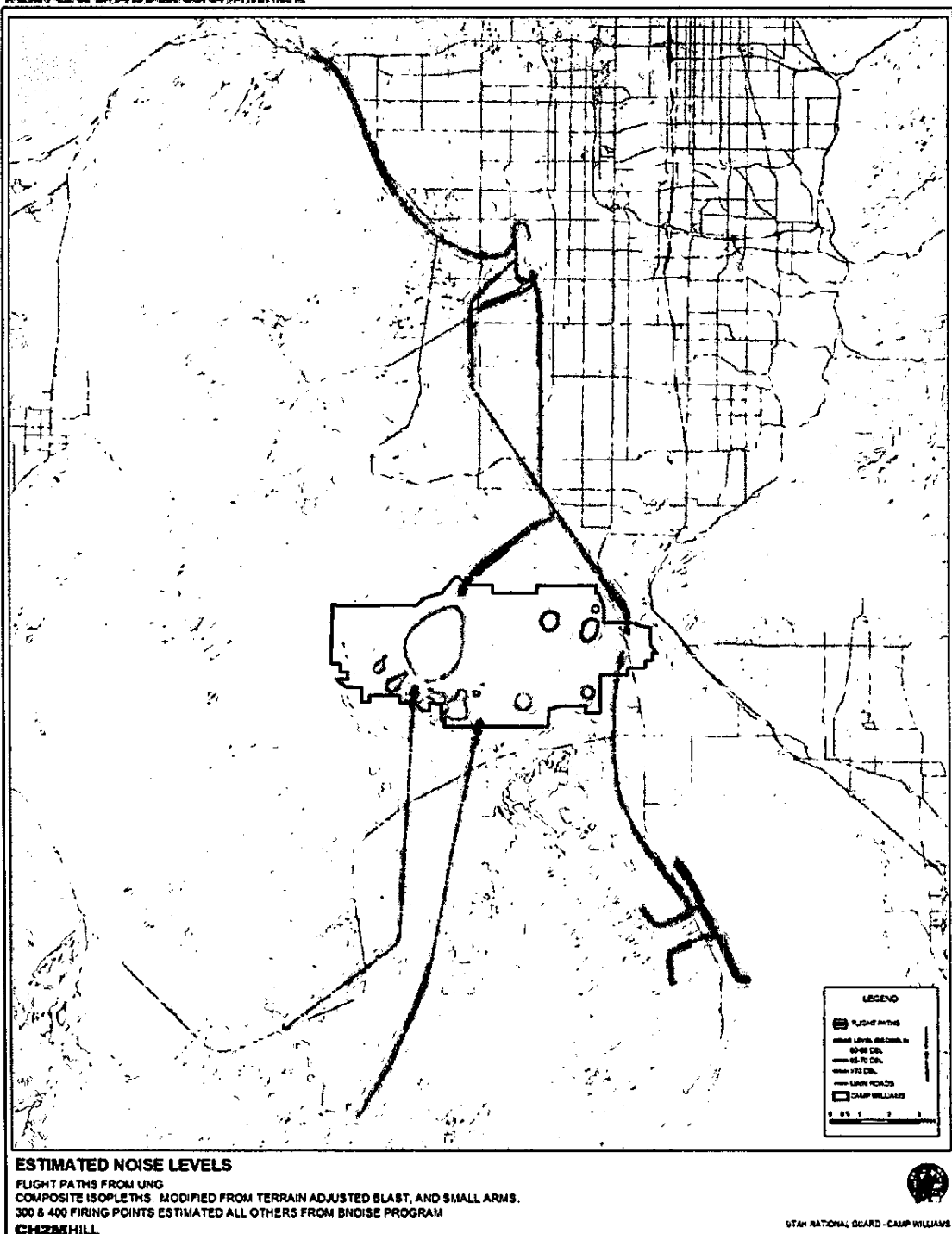


Figure 8: Estimated Noise Levels from Aircraft and Artillery at Camp Williams



PART 4 - Implementation

4.1 Recommended Plan and Ordinance Changes

In order to bring the East Area Master Plan in line with the current Herriman City General Plan and other applicable city, county and regional agency plans, the following steps are recommended:

1. Adopt the *Utah Wildland Interface Code (2006)* and *Unified Fire Authority Wildland Interface Graphic Representation Guide*.
2. Adopt the draft *Herriman City Parks, Recreation, Trails and Open Space Master Plan* and the *Southwest County Parks and Trails Master Plan*.
3. Adopt a groundwater protection ordinance.
4. Adopt a Hillside Overlay Zone ordinance for this area.
5. Update the economic element of the General Plan.
6. Update moderate income housing element of the General Plan.
7. Adopt a Military Activities Zone pertaining to Camp Williams land.

4.2 Design guidelines for East Plan Area

In order to ensure compatible design of buildings, site features and landscapes, design can be used to provide an additional level of oversight and continuity. These guidelines are recommended:

1. Use existing city design guidelines for:
 - a. *Medium Density Residential Design Guidelines (May 2007)*
 - b. *High Density Residential Design Guidelines (May 2007)*
 - c. *Commercial Design Guidelines (May 2007)*
2. Add guidelines that address the specific needs of the East Plan Area for:
 - a. Site Design
 - i. Site development standards
 - ii. Grading – applies to Laguna/Malibu
 - iii. Ridgeline – what points can be viewed from where
 - iv. Landscape standards (*Herriman City recommended trees and shrubs list*)
 - v. Preservation of existing trees and vegetation
 - vi. Park strip landscape
 - vii. Lighting, pathway lighting
 - viii. Wildfire
 - ix. Signage
 - x. Stormwater pollution protection
 - xi. Limits of disturbance
 - xii. Noise mitigation
 - xiii. Street tree requirement / ordinance
 - xiv. Sidewalks and pathways
 - xv. Parcel lot size (commercial)
 - xvi. Trails
 - xvii. Fence, walls and retaining
 - xviii. crosswalks
 - b. Structures
 - i. Porches, decks and overhangs
 - ii. Architectural standards
 - iii. open space – Passive and active
 - iv. Loading areas and accessory equipment
 - v. Garages and accessory buildings
 - vi. Storage
 - vii. Exterior materials
 - viii. Elevations
 - ix. Roofs

x. Style and character

4.3 Recommended Actions

In order to achieve many of the goals of the East Area Master Plan, Herriman City should initiate several special projects, including:

1. Formulate a deed notice or restriction to warn residents adjacent to Camp Williams of the special circumstances there.
2. Establish a preferred City alignment for the Bonneville Shoreline Trail.
3. Acquire land around the Bonneville Shoreline Trail serve as a buffer to Camp Williams.
4. Identify and acquire other priority open spaces in the City.
 - a. The Salt Lake County Open Space Fund can provide matching funds (up to 50% of the cost) for projects preserving important open spaces (typically defined by significant wildlife, recreation or viewshed importance, also includes public safety/welfare concerns , such as watershed). Herriman City could apply for funds for the Bonneville Shoreline Trail and cultural sites near it. Application details can be found at <http://www.openspace.slco.org/html/mission.html>
 - i. Landowners could do a “bargain sale” of the part of their land we wish to acquire to make up the 50% match. Bargain sale is selling to the County for less than the market value and taking a tax write-off for the difference.
 - ii. The County would own the land and a third party (like Utah Open Lands, or maybe even US DOD) would own the easement prohibiting development in perpetuity
5. Consider applying for federal funding to develop planning strategies to protect the future of Camp Williams, including:
 - a. ACUB application – Army Compatible Use Boundaries
 - b. JLUS application – Joint Land Use Strategies



HERRIMAN CITY

High density Design guidelines

May 3, 2007

Introduction

The information in the Herriman City High Density Design Guidelines for an attached housing development governs the appearance and use restrictions within Herriman City.

The High Density Residential neighborhoods shall help transition the density from the Medium Density Residential, Medium Density Cluster and the Commercial. These High Density Residential neighborhoods will be characterized by a gross density up to 20 dwelling units per acre and a minimum of 11 units per acre. High Density Residential housing will consist of Planned Unit Developments, Dwelling Groups and apartments which will have a variety of townhomes, condominiums or clustered housing. Units in these areas will be accessed from public and private streets, alleys, private driveways and lanes. Variations in setbacks, both in front and back and from side to side are to be encouraged. These projects shall pay close attention to perimeter landscaping and their transition from lower to higher density. **Landscaping and open space shall be used to buffer and soften the density. These areas should be located near the Mountain View Corridor.**

The open space within the neighborhood will be provided in the form of developed parks, club houses, public spaces, trails, and paths to encourage connectivity to other developments and to the regional trails network. Entry features and other streetscape enhancements will provide open space character to each site plan.

Interpretation

In interpreting and applying these guidelines, the provisions thereof shall be held to be the minimum requirements needed to promote the public health, safety, prosperity, aesthetics and general welfare of the present and future inhabitants of Herriman City. The final interpretation of these guidelines will be defined by the City's Land Use Authority per the City's Land Use Ordinance.

Applicability

The Design Guidelines shall apply to all High Density Residential development within Herriman City.

Site plans

Site plans should be well designed, pedestrian friendly and should provide connection to the overall trail system. The design should encourage slow travel speeds for vehicles. Site plans should avoid large expansive parking fields. Site plans should include elements to hide the parking from public view.

passive open space

These are areas of the development that are intended to stay undeveloped and retain their natural beauty and would retain a rural feel to the development. These areas might also provide a buffer to adjacent land owners or transition from one land use to another. These areas might include developed trails and roadways to facilitate access.

Active Open Space

These are the developed open space areas of the development. These areas include community or neighborhood parks, wide pedestrian walkways, trails and trail heads, playgrounds, ball fields, tennis courts, swimming pools, pavilions, picnicking areas, and community recreation centers. These areas focus on a full range of active recreational facilities. The developer shall develop an active open space area within a ½ mile of each resident within the development. This will help promote a walkable neighborhood and a sense of place within the development. Trail head parks shall have an open feel with 2-rail or 3-rail fences to delineate the boundaries. They should follow the general contour of the site and take advantage of view corridors. Trails shall be designed to take people to other specific places. Trails should not just dead-end.

The developer shall dedicate the active and passive open space on a plat by plat or phase by phase basis to the Home Owners Association or Herriman City.

Garages and Accessory Buildings

The use of recessed, side-access and alley loaded garages are encouraged. Garages may be attached or detached from the primary residence. Buildings with front-loading garages that protrude or that are flush with front of main building façade must have a covered porch. Other front-loading garages will be evaluated on a case-by-case basis by Herriman City. The visual image of attached garages should be minimized in the streetscape, and the garage should be proportionate to the homes living space. Front porches and building entries may protrude in front of the garage as allowed by the lot setback. Any detached garages or sheds must be similar in style and color to the buildings.

Storage

The design of the development shall provide adequate on-site storage to minimize the need for storage in parking areas.

Porches, Decks and Overhangs

Covered porches, decks and overhangs are strongly encouraged to provide variety to the building facades of each residence while maintaining architectural integrity and unity within the structure. The appearance of 'add-on' elements should be avoided by integrating these elements into the design of the structure. Porches should generally be designed to be open and inviting. They should not be long, narrow corridors leading to the front door.

Rear decks will be integrated into the design of the structure. The appearance of a deck supported by 'spindly legs' should be avoided with minimum size support posts of 6" x 6".

Architectural Standards

The architectural patterns within the development will include many different materials including: stucco, cement fiber siding, masonry, brick, and stone. Herriman City will have broad discretionary powers in the review and approval of architecture.

Style and Character

The general style and character of each residence shall be appropriate to the size of the site, the location within the development and the topography. Buildings on sloping lots that result in large retaining walls due to the poor integration of the buildings and topography may be denied by Herriman City. The incorporation of dormers, porches, wide roof overhangs, weather vanes & iron elements, shutters, accent shingles, and high percentage of glass and windows are strongly encouraged.

Exterior Materials and Colors

All exterior materials shall be suitable for the climate and exposure with a minimum of deterioration and wear. Materials will be selected that will be relatively maintenance-free. Herriman City may reject any architectural material that it deems to be of inferior quality, or problematic with regard to the intended use. New materials will be considered for use in the development as they are developed by the building industry. The primary material treatment must be selected from the following options.

1. Stucco with Masonry Base
2. Shingles with Masonry Base
3. Siding with Architectural Trim and Accent Elements
4. Siding with Masonry Base
5. Masonry with Architectural Trim and Accent Elements

Architectural colors will be harmonious with the setting and the neighboring properties. (Subtle or muted tones as well as earth tones are best for the dominant areas of the structure.) Pastels and bright colors will not be used. Roof colors will be evaluated as

they relate to the character of the home as well as for compatibility with the neighboring structures.

Architectural facades will be of consistent material and style compatible with surrounding residential areas.

1. All facades, including back and side elevations of a building generally visible from public view or adjacent to residential areas, should be architecturally treated and relate to but not overwhelm the neighborhood. All elevations generally visible from public view should reflect the overall design, colors and textures used on the front façade.
2. Design multi-building projects to include consistent design elements throughout the project.
3. Building elevations should incorporate architectural features and patterns that include a pedestrian scale.
4. Utilize architectural features, screen walls, landscaping into the overall building design.
5. Internalize roof drain elements within the building or an architectural feature such as columns (except at-grade discharge).
6. For all buildings at least two of these elements should repeat horizontally. Buildings with facades greater than 100 feet in length should include several of the elements listed below, repeated at appropriate intervals, either horizontally or vertically:
 - a. Color change. Recognizable, but not strongly contrasting.
 - b. Texture change.
 - c. Material change.
 - d. Architectural variety and interest through a change in plane such as offsets.
 - e. Reveals, archways or projecting rigs.
 - f. Wall plan projections or recesses.
7. Wall elevations should terminate at a logical point.
8. Variations in rooflines or parapets should be used to reduce the scale of residential buildings. Roof size, shape, material, color and slope should be coordinated with the scale and theme of the building.
9. The size of all roof elements should be appropriate to the size and scale of roofing materials used. Buildings with sloping roofs should include multiple planes.
10. Solid and soft or open areas of the façade should be arranged to create a relationship that complements the architectural style of the structure. Soft or open building elements include windows, entryways, porches, arcades, etc.
11. Predominant exterior building materials should be of high quality and durable. These include, but are not limited to:
 - a. Stone, natural or faux.
 - b. Integral color, sand blasted or stained textured masonry.
 - c. Split-face or scored concrete masonry units.
 - d. Textured tilt-up concrete panels.

- e. Stucco/EFIS.
 - f. Concrete and clay tile roofs.
 - g. Clear and tinted glass.
 - h. Architectural metal.
 - i. Predominant exterior building materials should not include the following:
 - Un-textured tilt-up concrete panels.
 - Pre-fabricated steel panels.
 - Corrugated metal.
 - Asphalt shingled roofs, except for period architecture.
 - Highly reflective glass.
12. Predominant façade colors should possess low reflectivity characteristics, and respect the diversity of color incorporated in the country lifestyle. The use of bright color schemes should be justified by the overall design, and may not be appropriate in many contexts.
13. Building trim and accent areas may feature different building materials and different colors than the building field color, including use of primary colors, if compatible with the architectural design.

Elevations

The exterior of each unit must meet or exceed the following minimum standards for finish and materials. All windows and doors should be trimmed or set apart from the plane of the façade by accent colors. The use of shutters or similar exterior trim elements is encouraged.

Side Building Elevation & Rear Elevation

Any building that has a side or rear elevation that is on open space or public right-of-way must have the same architectural elements as the front façade and the same attention to architectural detail.

Roofs

The design of the roof should appear as an integrated architectural element. Twenty Five year architectural grade roofing is the minimum required for roofs in the development. Other shingle materials that meet or exceed the minimum requirement may be approved by Herriman City.

A minimum fascia height of 4” will be required for all units. These elements will be finished to match the finish and color or the trim of accent color of the building. Exposed rafters and open soffits will only be allowed by Herriman City when they relate to the

style of the architecture. In such cases, the soffit and rafters must be painted to match the building. Soffit and fascia finish materials must be approved by Herriman City.

Fencing, Walls and Retaining

Fencing and walls around high density residential units is permitted. No chain link fencing shall be permitted with the exception of sport court fencing. Such fencing shall be screened from public view. All fences on sloping lots must comply with these standards while stepping with the grade with the exception that open, three rail fences may follow the contour of the site. The top rail of stepped fences must be constructed in a level plane. On stepped fences the height shall be measured at a point that is midway between posts. Fences must step in four or eight-foot lengths as determined between posts. Other fencing may be required for specific sites. All trash enclosures must be screened from public view and the screening must be the same as the primary structures.

Park Strip Landscaping

All park strip areas adjacent to the front, rear and side yard areas of each unit are to be landscaped by the builder and maintained by the adjacent property owners. Tree specifications must follow the guidelines outlined in the Herriman City Approved Tree and Shrub List. No materials other than the approved trees or grass may be installed in park strip areas. Rocks, gravel, bark, or other types of xeroscaping are not acceptable landscape materials for park strip areas. Street trees shall be located within the park strip between the sidewalk and the curb. Clear zones for visibility and safety must be considered when locating street trees on corner lots. The side park strips must follow the rule of one tree every 25'. Any tree that is placed in the park strip that is contrary to the Herriman City Approved Tree and Shrub List may be removed and replaced with an appropriate tree by Herriman City at the owner's expense.

The balance of the front yard shall be landscaped with sod, ground cover, or planting beds. Visual clearance for driveways and streets must be maintained.

Landscaping in each development shall conform to the above listed standards where applicable, but should also provide a landscape plan as part of the site plan submittal to the City. The landscaping should be designed to help soften the density and generally should be maintained under a Home Owner Association. Individual units shall be allowed to have a small area of private landscaping, but in general this area should be screened from public view.

Preservation of Existing Trees and Revegetation

Significant areas of native trees or exceptional specimens of native trees may exist within a development. These trees shall be identified as part of the Site Plan and should also be identified on the builders' specific building plan. Care should be taken to preserve as many of these native trees as possible within the building lots. Wherever possible, development plans shall strive to locate native trees in common areas.

Walkways and Paths

Each development should include a wide variety of common area walkways, paths and trails. The type of construction, size and location of these trails will be determined by the City during the design of each phase of construction. The eventual use and development need will be evaluated when determining the level of facility that is to be built.

Pathway Lighting

Major pathways within the core areas of the development may be illuminated. These light fixtures shall be approved by the City. Illumination levels shall be chosen based on the intended use of the pathway, location within the development and safety criteria.

crosswalks

Use of crosswalks shall be incorporated within the development, at intersections, within parking lots, or other needed pedestrian connections. Crosswalks shall be so configured to be a design feature of the development, i.e. heavy painted lines, pavers, edges, and other methods of emphasizing pedestrian use. Bulb-outs and other pedestrian design may be used to shorten walking distances across open pavement. Medians may be used in appropriate areas to encourage walking and to act as a "refuge" for crossing pedestrians. In mountain areas with challenging slopes ADA ramps at the intersection may not meet ADA specifications, in such areas; the developer shall do one of two things: 1) Developer shall get written documentation from their engineer indicating the reason why the ramps cannot comply with ADA standards; or 2) Eliminate the sidewalk in areas with short cul-de-sac streets.



HERRIMAN CITY

Medium density residential Design guidelines

May 3, 2007

Introduction

The information in the Herriman City Medium Density Design Guidelines for detached single family housing and attached Medium Density Cluster development governs the appearance restrictions within Herriman City.

Individual homes are anticipated to be accessed from public, local streets; however, a sub-local street standard or shared driveway may be used, particularly for clustered development. These neighborhoods will be characterized by a variety of lot sizes. Variations in setbacks, both in front and back and from side to side are to be encouraged. Uniformity in front facades shall be avoided. To the greatest extent possible, subdivision design should take advantage of the views.

While individual yard space will provide some of the open space within the neighborhood, community open space will be provided in the form of parks, public spaces, trails, and paths to encourage connectivity to other developments and to the regional trails network. Entry features and other streetscape enhancements will provide open space character to the neighborhoods.

Interpretation

In interpreting and applying these guidelines, the provisions thereof shall be held to be the minimum requirements needed to promote the public health, safety, prosperity, aesthetics and general welfare of the present and future inhabitants of Herriman City.

The final interpretation of these guidelines will be defined by the City's Land Use Authority per the City's Land Use Ordinance.

Applicability

The Design Guidelines shall apply to all Medium Density Residential development within Herriman City.

Floor plans

Multiple copies of the same floor plan may be constructed every third house when counted on either side of the street. There must be at least two (2) houses of differing floor plans between duplicative or the same floor plan. To modify a duplicative floor

plan so that it is not considered the same, the builder or owner must consider a number of the following design changes:

- Altering the rooflines
- Changing color schemes
- Altering siding textures
- Moving garages
- Increasing or altering windows
- Increasing or altering covered porches

Sidewalks and pathways

The design of pedestrian ways may include a solitary meandering pathway, sidewalk, or trail. Choice of appropriate pedestrian access will be made based upon the scale and type of the development being proposed. The standard ten foot cross section (five foot park strips, five foot sidewalk) is a minimum, while a wider park strip and/or sidewalk may be used depending upon the desired effect.

crosswalks

Use of crosswalks shall be incorporated within the development, at intersections, within parking lots, or other needed pedestrian connections. Crosswalks shall be so configured to be a design feature of the development, i.e. heavy painted lines, pavers, edges, and other methods of emphasizing pedestrian use. Bulb-outs and other pedestrian design may be used to shorten walking distances across open pavement. Medians may be used in appropriate areas to encourage walking and to act as a “refuge” for crossing pedestrians. In mountain areas with challenging slopes ADA ramps at the intersection may not meet ADA specifications, in such areas; the developer shall do one of two things: 1) Developer shall get written documentation from their engineer indicating the reason why the ramps cannot comply with ADA standards; or 2) Eliminate the sidewalk in areas with short cul-de-sac streets.

Parcel lot size

The Medium Density Residential neighborhoods shall help transition the density from the Low Density to the High Density Residential and Commercial. Lot sizes and frontages should be varied to encourage a variety of architectural housing types. The Medium Density Cluster should be used next to the High Density Residential and the Medium Density Residential should be used next to the Low Density Residential.

Passive open space

These are areas of the development that are intended to stay undeveloped and retain their natural beauty and would retain a rural feel to the development. These areas might also

provide a buffer to adjacent land owners or transition of one land use to another. These areas might include developed trails and roadways to facilitate access.

ACTIVE OPEN SPACE

These are the developed open space areas of the development. These areas would include regional, community or neighborhood parks, pedestrian walkways, trails and trail heads, playgrounds, ball fields, tennis courts, swimming pools, pavilions, picnicking areas, or community/recreation centers. These areas focus on a full range of active recreational facilities. The developer will develop an active open space area within a ½ mile of each resident within the development. This will help promote a walkable neighborhood and a sense of place within the development. Trail head parks will have an open feel with 2-rail or 3-rail fences to delineate the boundaries. They should follow the general contour of the site and take advantage of view corridors. Trails will be designed to take people to other specific places. Trails should not just dead-end.

The developer shall dedicate the active and passive open space on a plat by plat or phase by phase basis to the Home Owners Association or Herriman City.

Garages and accessory buildings

The use of recessed and side-turned garages is encouraged. Garages may be attached or detached from the primary residence. Front-loading garage doors must not protrude in front of the main building façade without specific approval. Buildings with front-loading garages flush with front of main building façade must have a covered porch. Other front-loading garages will be evaluated on a case-by-case basis. The visual image of attached garages should be minimized in the streetscape, and the garage should be proportionate to the homes living space. Front porches and building entries may protrude in front of the garage as allowed by the lot setback.

storage

The design of the development shall provide adequate on-site storage to minimize the need for storage in parking areas.

Porches, Decks and Overhangs

Covered porches, decks and overhangs are strongly encouraged to provide variety to the building facades of each residence while maintaining architectural integrity and unity within the structure. The appearance of 'add-on' elements should be avoided by integrating these elements into the design of the structure. Porches should generally be

designed to be open and inviting. They should not be long, narrow corridors leading to the front door.

Rear decks will be integrated into the design of the structure. The appearance of a deck supported by 'spindly legs' should be avoided with minimum size support posts of 6" x 6".

Minimum building size

- A rambler-style single family dwelling shall have a minimum 1500 square feet on the main floor, and a minimum of a 2-car garage.
- A two-story single family dwelling shall have a minimum of 1300 square feet on the main floor, and the total finished square footage shall be a minimum of 2000 square feet; with a minimum of a 2-car garage.
- A clustered group of dwellings shall each have a minimum of 1100 square feet on the main floor, and a minimum of a 1-car garage.

Style and Character

The general style and character of each residence should be appropriate to the size of the lot, the location within the development and the topography. Homes on sloping lots that result in large retaining walls due to the poor integration of the home and topography are discouraged. The incorporation of dormers, porches, wide roof overhangs, weather veins & iron elements, shutters, accent shingles, and high percentage of glass and windows are strongly encouraged.

Exterior Materials and Colors

All exterior materials should be suitable for the climate and exposure with a minimum of deterioration and wear. Materials will be selected that will be relatively maintenance-free. Herriman City may reject any architectural material that it deems to be of inferior quality, or aesthetic appearance or problematic with regard to the intended use. New materials will be considered for use in the development as they are developed by the building industry. The primary material treatment must be selected from the following options.

1. Stucco with Masonry Base
2. Shingles with Masonry Base
3. Siding with Architectural Trim and Accent Elements
4. Siding with Masonry Base
5. Masonry with Architectural Trim and Accent Elements

Architectural colors will be harmonious with the setting and the neighboring properties. (Subtle or muted tones as well as earth tones are best for the dominant areas of the structure.) Pastels and bright colors should not be used. Roof colors will be evaluated as

they relate to the character of the home as well as for compatibility with the neighboring structures.

Elevations

The exterior of each unit must meet or exceed the following minimum standards for finish and materials. All windows and doors should be trimmed or set apart from the plane of the façade by accent colors. The use of shutters or similar exterior trim elements is encouraged. Each home shall have a porch that extends out from the front façade of the home.

Front building elevation

Brick, rock or stone must be used for the finish system on the front building façade and must make up a minimum of 25% of the total area of the front. If the home incorporates a front porch across the entire front façade of the house the brick, rock, or stone can be reduced to 10%. Brick or stone should be used on the front elevation to show significant masonry architectural detail in the form of vertical accents. Manufactured materials may be substituted for real stone products. The remainder of the front elevation may be finished with a combination of stucco, fiber cement material, or brick products. The use of vinyl and aluminum siding is discouraged. The trim should be applied consistently with the architectural style of the home. Trim should be applied so that it adds dimension to the front façade. The use of more than three finish materials in the front elevation is discouraged. All finish materials used and their placement on the façade must be indicated on the elevation rendering. Where living space is added above the garage the front façade must include windows and other treatments to avoid a large blank wall space above the garage doors. Driveway locations should be selected to promote pedestrian friendly pathways.

Side building elevation

The side of the building should have the same primary material treatment as the front. Each side elevation must include at least two windows per floor, unless the home contains a wainscot that covers the entire length of the side elevation. In which case, only one window per floor is required. The windows should make up 5% of the side façade for a standard lot. For corner lots the windows should make up 10% of the façade and must have similar window treatments as the front façade windows, i.e. trim and/or shutters.

Rear elevation

Any home in which the rear of the building is facing a street or open space, the rear elevation must have the same architectural elements as the front elevation, i.e. trim, shutters, rock, stone, masonry base. In other words, it must appear double fronted.

Landscaping can also be used to help break-up the back wall, but cannot be used exclusively.

Roofs

Roof planes for lots on a street without a cul-de-sac should have a minimum pitch of 6:12 (vertical to horizontal). Lesser pitches may be utilized on small areas of the roof plan such as shed dormers and patio or porch roofs. The design of the roof should appear as an integrated architectural element. Twenty five year architectural grade roofing is the minimum required for roofs in each development.

A minimum fascia height of 4' shall be required for all homes. The elements should be finished to match the finish and color or the trim of accent color of the home. Exposed rafters and open soffits should only be allowed when they relate to the style of the architecture. In such cases, the soffit and rafters must be painted to match the building.

Fencing, Walls and Retaining

Fencing and walls around residential lots is permitted. No chain link fencing will be permitted with the exception of sport court fencing. Such fencing should be screened from public view. All fences on sloping lots must comply with these standards while stepping with the grade with the exception that open, three rail fences may follow the contour of the site. The top rail of stepped fences must be constructed in a level plane. On stepped fences the height shall be measured at a point that is midway between posts. Fences must step in four or eight-foot lengths as determined between posts. Other fencing may be required for specific sites.

Park Strip Landscaping

All park strip areas adjacent to the front, rear and side yard areas of each lot are to be landscaped by the homebuilder and maintained by the homeowner. Tree specifications must follow the guidelines outlined in the Herriman City Approved Tree and Shrub List. No materials other than the approved trees or grass may be installed in park strip areas. Rocks, gravel, bark, or other types of xeroscaping are not acceptable landscape materials for park strip areas. Street trees should be located within the park strip between the sidewalk and the curb. Clear zones for visibility and safety must be considered when locating street trees on corner lots. The side park strips should follow the rule of one tree every 25'. Any tree that is placed in the park strip that is contrary to the Herriman City Approved Tree and Shrub List may be removed and replaced with an appropriate tree by Herriman City at the owner's expense.

The balance of the front yard should be landscaped with sod, ground cover, or planting beds. Visual clearance for driveways and streets must be maintained.

Landscaping in each development should conform to the above listed standards where applicable, but should also provide a landscape plan as part of the site plan submittal to

the City. The landscaping should be designed to help soften the density and generally should be maintained under a Home Owner Association. Individual units in a PUD should be allowed to have a small area of private landscaping, but in general this area is to be screened from public view.

Preservation of Existing Trees and Revegetation

Significant areas of native trees or exceptional specimens of native trees may exist within a development. These trees should be identified as part of the Site Plan and should also be identified on the builders' specific building plan. Care should be taken to preserve as many of these native trees as possible within the building lots. Wherever possible, development plans should strive to locate native trees in common areas.

Walkways and Paths

Each development should include a wide variety of common area walkways, paths and trails. The type of construction, size and location of these trails will be determined by the City during the design of each phase of construction. The eventual use and development need will be evaluated when determining the level of facility that is to be built.

Pathway Lighting

Major pathways within the core areas of the development may be illuminated. These light fixtures will be approved by the City. Illumination levels should be chosen based on the intended use of the pathway, location within the development and safety criteria.

ROSECREST

A Master-Planned Community

Attachment

- **Low Density Residential (LDR)**
- **Medium Density Residential (MDR)**
- **Medium Density Cluster(MDC)**
- **High Density Residential (HDR)**

TECHNICAL GUIDELINES

Final

RESIDENTIAL DEVELOPMENT

1.0 INTRODUCTION

The information in the Rosecrest Technical Guidelines govern Residential uses for Low, Medium, Medium Cluster, and High Density development. The guidelines control the appearance and use restrictions within the Rosecrest Development. The intent of these guidelines is to preserve the integrity of the land use plan and its proposed configurations within the residential areas. The guidelines for commercial shall follow the Herriman City Guidelines as outlined in each commercial zone.

The rules and regulations within this document will help to ensure that the visual quality and desirability that form the basis for investing in the Rosecrest Development remains stable for both current and future residents. These guidelines, in addition to the following documents:

Rosecrest Master Development Agreement (RMDA)
Rosecrest Land Use Plan (RLUP)
Rosecrest Planned Unit Development Approval (PUD)
Rosecrest Covenants, Conditions and Restrictions (CC&R's)

shall guide the decisions that are made by the Rosecrest Design Review Committee (RDRC) when reviewing applications for development or construction.

2.0 TECHNICAL GUIDELINES

2.1 Purpose and Intent •

This document is intended to be an appendix to the Rosecrest Master Development Agreement and to govern all residential development and construction within the Rosecrest Development.

2.2 Use of Technical Guidelines •

The Master Developer or subsequent developer shall utilize these guidelines when designing neighborhood and reviewing applications for residential and/or sub-developer construction. These guidelines shall be made available to lot owners at the time of closing. Copies of these documents shall be available for review at the offices of Rosecrest, Inc. ("Rosecrest") during normal business hours. Additional copies may be purchased for a nominal fee that is determined solely by the RDRC.

2.3 Compliance with Guidelines •

Residential construction shall conform to these guidelines. This includes new construction, modifications or additions to existing structures that may or may not require the issuance of a building permit. Landscaping, grading and site development work within the boundary of an individual lot is also covered by the requirements of this document. The guidelines shall equally be applied to both developer initiated construction as well as that of individual lot owners.

2.4 Modification of Guidelines •

These Guidelines may be modified upon approval of the RDRC in an effort to respond to future development or issues within the Development. The text of all such modifications shall be available for review at the offices of Rosecrest. Any Modifications or change shall follow the procedures as outlined in the Master Development Agreement in Sections 21 and 22. The modifications shall become effective upon approval of the RDRC. More restrictive guidelines may be approved at the discretion of the RDRC.

2.5 Exception & Exemptions •

The RDRC may grant an exception or exemption from any section of these guidelines upon completion of a review hearing to be held before the RDRC. The exemption shall be based upon a finding that strict conformance to the requirements would:

1. not create an unreasonable hardship or burden,
2. would not have a substantially adverse effect on the Owners or Occupants of neighboring parcels,
3. is consistent with the original design intent for the Rosecrest

Development,

4. all adjacent neighbors are notified and a written notification that each neighbor understands the request, and
5. approval from the City where necessary.

The applicant shall submit a request with all the support data, drawings and evidence that is necessary to clearly understand the exception or exemption that is being requested. The RDRC shall give notice within 14 days if the application for exception or exemption is complete. The RDRC reserves the right to request any information to clearly understand the request. The cost to obtain the requested information shall be the sole responsibility of the applicant. If the applicant does not provide the requested information for the application the exception or exemption shall be denied. Once the applicant receives notice from the RDRC that it has received a completed application the RDRC shall review the application within 14 days and a decision shall be given within 7 days of the review.

3.0 BUILDING DESIGN REVIEW PROCESS

The process for reviewing residential applications within Rosecrest shall be as follows:

3.1 Rosecrest Design Review Committee •

Rosecrest shall appoint the Rosecrest Design Review Committee (RDRC). The committee shall contain no fewer than three members or no more than seven members. Members of the RDRC may be compensated for their time in reviewing applications.

3.2 Review Submittals •

Three sets of plans detailing any building improvements or changes to a lot or dwelling shall be submitted to the RDRC for approval. All plans shall be drawn to scale where appropriate, and sheet size should not exceed 24" x 36". In addition to meeting the minimum requirements of this document, each application for approval must achieve a minimum score of 10-points or more for upgrades as detailed in Exhibit "A". The plan submittal shall include the following information:

- A. Rosecrest Design Review Committee Review Application
- B. Site Development Plans that include the following (all plans must be prepared by a qualified engineer, licensed to practice in the State of Utah):
 - Lot boundary and dimensions
 - Dimensioned building pad

- Extensions of building (ie decks and patios)
 - Locations of easements, rights-of-way and setbacks
 - Locations of any existing improvements or landscape elements
 - Location and size of all proposed improvements
 - Front, side and rear elevations of any architectural element or improvements
 - Grading and Drainage
 - Erosion control measures
- C. List of all exterior materials and colors (where appropriate)
- Samples of any unusual or custom materials
- D. Landscape plans and plant materials (where required)
- E. Any additional information as required by the RDRC
- F. Rendering or picture of structure or modification proposed
- G. Rosecrest 10 Point Upgrade Checklist

3.3 Multiple Copies of Same Floor Plan •

A Builder that proposes to build multiple copies of the same home must provide this information for each model. All variations of Elevations for the model must be approved by the RDRC. Additionally, the Builder must submit all required site plan information to the RDRC for review each time the floor plan is to be placed upon an individual lot within the development. Multiple copies of the same home can only be constructed in accordance with the applicable rules within these guidelines, which require the following:

Multiple copies of same floor plan can be constructed every third house when counted on either side of the street. There must be at least (2) houses of differing floor plans between duplicative or the same floor plan. To be considered a non-duplicative floor-plan the house must be substantially different in the following aspects:

- Altering the rooflines,
- Changing color schemes,
- Altering siding textures,
- Location of the garage with respect to the rest of the structure,
- Increasing or altering windows,
- Increasing or altering covered porches,
- ** Any changes subject to approval by RDRC

3.4 Review Fees (All Fees are Privately Assessed) •

A reasonable fee may be charged for the review process. Any request for construction deemed unusual by the RDRC may require the review of an expert in the field or a consultant. Fees for such review will be charged to the applicant. All review fees must be paid at the time of submittal or upon notification that a consultant will be used to complete the review.

A builder that proposes to construct multiple copies of the same home may request an adjusted fee schedule for reviews by the RDRC.

Applications, plans and fees shall be submitted to:

Rosecrest Design Review Committee
4393 River Boat Road #450
Salt Lake City, Utah 84123
(801) 461-9700/ Phone
(801) 461-9723 / Fax

3.5 Changes After Final Review •

There may be occasions when an Owner desires to make a change that significantly affects the exterior of the building or the site after construction documents are reviewed and approved. A significant change shall be one that affects the structural elements of a building elevation ie., windows, roof, exterior materials, retaining or grading, and the protrusion of the garage. When an applicant wishes to make such a change, which deviates from the plans as approved by the RDRC, the applicant must submit a written request to the RDRC along with a set of plans that clearly delineates the proposed change. No changes will be allowed unless approved by the RDRC. The RDRC reserves the right to charge an additional fee for this review process.

3.6 Decisions •

The RDRC shall review all submitted applications and shall furnish a written decision to the applicant setting forth the reasons for its decision, including the nature of any objections it has to the request. The RDRC shall determine whether an application is complete and in compliance with these guidelines. Incomplete applications will be returned to the applicant for re-submittal. In addition, the RDRC may disapprove any application if the RDRC, in its discretion, believes the applicant has not provided sufficient or accurate information or has not complied with the intent of these Guidelines.

All decisions of the RDRC shall be reported to the Herriman Planning/ Building Department and shall become a part of the official file for each lot or building parcel. Two sets of approved plans shall be returned to the applicant and one set shall be retained by the RDRC until construction of the proposed improvements are complete. At that time the RDRC may dispose of the drawings and submittal package. The applicant will be required to submit one approved submittal package to the Herriman Building Department with the building permit application.

3.7 No Liability for Approval of Plans •

Any approval of plans, specifications or proposed construction given by the RDRC, or its designees, shall be only for the purpose of permitting construction of the proposed improvements within the Rosecrest Development as they relate to these Guidelines. Such approval shall not constitute compliance with any applicable City, County, State or Federal laws or regulations. Such approval shall not constitute an approval or endorsement of the quality of architectural and engineering soundness of the proposed improvements. Neither the RDRC nor Rosecrest shall have any liability in connection with or related to approved plans, specifications or improvements.

3.8 Accuracy of Information •

Any applicant submitting plans to the RDRC shall be responsible for verifying the accuracy of all components of the submittal package. The RDRC reserves the right to reject any application based upon the suspicion that the submittal does not accurately reflect ground or building conditions.

Approval of an application by the RDRC does not constitute actual or implied warranty with regard to site or building conditions.

4.0 Neighborhood Design

Individual homes are anticipated to be accessed from public, local streets; however, a sub-local street standard or shared driveway may be used. These neighborhoods will be characterized by a variety of lot sizes. Variations in setbacks, both in front and back and from side to side are encouraged. Uniformity in front facades shall be avoided. To the greatest extent possible, subdivision design shall be such that it takes advantage of the views.

4.1 Street Access•

Accesses within a neighborhood should have connectivity with existing and future street patterns. The location and size of the Collector and Arterial Streets

shall generally follow the Master Transportation Plan located in **Appendix “E”** of the Master Development Agreement or the City’s Master Transportation Plan for East Herriman planning area.

In general all neighborhoods shall have two points of access as required by Herriman ordinance. This can be achieved by the following methods.

1. Two separate neighborhood streets that connect to an arterial or collector street that is at least a 66’ right-of-way.
2. A grade separated divided roadway with minimum lane widths of 20’.
3. Uses of an all-weather surface, temporary, emergency access road that is maintained by the developer or builder until future phases bring secondary access.

The use of single access streets shall be allowed to promote efficient land planning and to minimize grading. Single access streets length should not exceed 1,200 LF. In instances where single access streets longer than 1,200 LF are allowed, some of the following mitigating measures will be made such as; intermediate turnarounds, additional asphalt width in the Right-of-Way, grade separated roadways, additional fire hydrants, fire sprinkling systems in homes, or increased fire breaks.

Private areas and gated streets are allowed as long as adequate emergency vehicle access can be maintained. The overall design should promote lower design speeds.

4.2 Street Width •

Street width shall follow the City Master Transportation Plan and the cross-sections as provided in **Exhibit “B.”** In general, streets shall be designed to meet the level of travel, safety and service, while incorporating principles of traffic calming and pedestrian compatibility, i.e., tree-lined streets with pedestrian ways and linkages, decreasing the need for pavement width by spreading traffic through a grid or modified street hierarchy system.

4.3 Sidewalks and Pathways •

The Rosecrest Development will include a wide variety of common area walkways, paths, and trails. The type of construction, size, and location of these trails will be determined by Rosecrest and the location will be coordinated with City during the design of each phase of construction. The eventual use and development need will be evaluated when determining the level of facility that is to be built. Standard sections for these improvements are included in

Exhibits "C" & "I", the 'Trails and Open Space Master Plan' and 'Trails Cross Sections.'

4.4 Crosswalks •

Use of crosswalks shall be incorporated within the project, at intersections, within parking lots, or other needed pedestrian connections. Crosswalks shall be so configured to be a design feature of the development, i.e. heavy painted lines, pavers, edges, and other methods of emphasizing pedestrian use. Bulb-outs and other pedestrian design may be used to shorten walking distances across open pavement. Medians may be used in appropriate areas to encourage walking and to act as a "refuge" for crossing pedestrians. In mountain areas with challenging slopes ADA ramps at the intersection may not meet ADA specifications. In such areas, the developer shall get written documentation from their engineer indicating the reason why the ramps cannot comply with ADA standards.

4.5 Parcel Lot Size •

Parcels shall be of sufficient size to assure compliance with the approved plat, and the following standards:

Map Designation	AVERAGE Allowable Lot Size	Minimum Lot Frontage	Minimum Cul-de-Sac Frontage (Arc Length at Setback)
Low	8,500 sf	75'	50'
Medium	4,000 sf	65'	45'
Medium Cluster	N/A	0' - See Setback requirements	0' - See Setback requirements
High	N/A	0' - See Setback requirements	0' - See Setback requirements

4.6 Open Space•

There are two primary types of Open Space within the development. Both Passive and Active Open Space shall follow the land use plan and satisfy the open space requirement. The areas to be dedicated as open space shall follow the Open Space and Trails Plan found in **Exhibit "C"**.

Passive Open Space – These are areas of the project that are intended to stay undeveloped and retain their natural beauty and would retain a rural feel to the project. These areas may include hillsides, ridgelines, natural drainage corridors, and canyons. These areas might also provide a buffer to adjacent land owners or transition of one land use to another. These areas might include

developed trails, roadways to facilitate access, utility corridors, detention facilities, debris basins, swales, and public works facilities.

Active Open Space – These are the developed open space areas of the project. These areas would include community or neighborhood parks, pedestrian walkways, wide parkways, trails and trail heads, playgrounds, ball fields, golf courses, detention areas, tennis courts, swimming pools, pavilions, picnicking areas, community / recreation centers, community gathering spaces, etc. These areas focus on a full range of active recreational facilities. The developer shall develop an active open space area within a quarter mile of each resident within the development. This will help promote a walkable neighborhood and a sense of place within the development.

4.7 Area of Disturbance •

Nondisturbed areas will be identified on the Area of Disturbance Map, which will be provided with each plat submittal. 30% sloped areas may be within a lot. There may be instances where utilities, roadways and trails may need to cross an area of 30% slope. There may also be anomaly areas within a plan caused by erosion or other factors which may require some grading. These anomaly areas shall be defined on the grading plan. All plans should be designed to the natural slope where possible. Retaining is preferred over long shallow cut or fill slopes. Retaining walls should be integrated with landscaping features to provide screening

4.8 Storm Drainage•

All drainage facilities shall be designed for the 10-yr 24-Hr storm event and provide routing for the 100 year storm event. The drainage system should be designed to use the regional detention facilities as outlined on the City Storm Drain Master Plan. The uses of neighborhood basins are allowed if the drainage cannot be reasonably taken to one of the regional facilities. The use of temporary detention or retention facility may be approved in the event the offsite project facilities are not completed at the time of the project. Master Developer shall maintain or cause to be maintained any temporary detention/retention facilities in a good working condition until such time that a replacement, permanent storm drain facility has been constructed and functioning. Such replacement facility must be constructed pursuant to the City's Future Laws. Temporary detention/retention facilities are not allowed within a subdivision. Any temporary detention/retention facilities that are located within a clear view of a major right-of-way or within a clear view of the general public shall be maintained free from weeds and debris. Permanent detention/retention facilities are allowed within a subdivision. All permanent

detention/retention facilities shall be landscaped with sod and sprinkler irrigation per City's Future Laws and be kept free from weeds and debris. Permanent detention/retention facilities may include a secondary use such as parks, ball fields, etc.

5.0 SITE DEVELOPMENT STANDARDS

Proposed construction of improvements within lots and building sites for Residential homes shall be reviewed and approved according to compliance with the following standards.

5.1 Setbacks •

Residential building setbacks within Rosecrest shall vary according to lot size and land use. Setbacks are listed in the following chart. Additional setback modifications may be required along certain collector roadways as designated by the RDRC. Easements for utilities and drainage may exist along individual lot lines. These easements may be greater than the required setbacks that are listed below. Houses shall be staggered to avoid uniformity.

Primary Structures – (Measured to the Public Right-of-Way)

Map Designation	Lot Size	Front Yard	Rear Yard	Side Yard	Corner Yard	Side Turned Garage Side Yard	Accessory Building Size
Low	8,500-17,999 s.f.	28'	28'	8' min./ 16' Total	20'	N/A	1,200 s.f.
Low	18000+ s.f.	30'	30'	10' min./ 24' Total	20'	8' min./ 24' Total	1,200 s.f.
Low	43,560 s.f. (Transition)	32'	30'	12' min.	20'	N/A	1,200 s.f.
Medium	4,000-8,000 s.f.	10' (20' to Garage)	15'	5' min./ 10' Total	18'	N/A	1,200 s.f.
Medium	8,001-10,000 s.f.	20'	20'	5' min./ 12' Total	18'	N/A	1,200 s.f.
Medium	10,001-12,000 s.f.	25'	25'	6' min./ 15' Total	20'	N/A	1,200 s.f.
Medium	12,001+ s.f.	28'	28'	8' min./ 18' Total	20'	6' min./ 18' Total	1,200 s.f.
Medium Cluster	N/A	18' w/ Front Driveway/ 15' w/ Alley or Lane	15' from adjacent building unless attached	15' from adjacent building unless attached	20'	N/A	N/A
High	Public Right-of-Way	15' (20' to Garage)	15'	15'	18'	N/A	N/A
High	Private (Measured from TBC)	8' to Garage	15'	10'	18'	N/A	N/A
High	Public Open Space	8'	12'	6'	N/A	N/A	N/A
All Densities	Accessory Building	6' from main structure	10'	5'	N/A	N/A	N/A
All Densities	Front Porches	Less 4' of Setback (not in MDC)	N/A	N/A	N/A	N/A	N/A
All Densities	Rear Decks (2' Above Grade)	N/A	15'	6'	N/A	N/A	N/A
All Densities	Rear Decks (2' Above Grade) Adjacent to Open Space	N/A	5'	6'	N/A	N/A	N/A
All Densities	Patios, Decks, & Walks at Grade	N/A	4'	4'	N/A	N/A	N/A
All Densities	Public Utility Easement	10'	10'	5'	10'	N/A	N/A

5.2 Building Heights •

Detached garages or accessory buildings in the rear of the lot may not exceed 18' as measured from the finish main floor elevation. Second level shall be allowed in detached garages only upon approval from the RDRC and shall not exceed a maximum of 35' in height. Main structure building heights for specific densities are as follows:

- Low density – 35'
- Medium density – 35'
- Medium Cluster density – 35'
- High density – 45'

5.3 Garages and Accessory Buildings •

The following guidelines are for Low Density Residential (LDR) and Medium Density Residential (MDR):

The use of recessed and side-turned garages is encouraged. Garages may be attached or detached from the primary residence. Front-loading garage doors must not protrude in front of the main building facade without specific approval of the RDRC. See **Exhibit “E”** for examples of appropriate garages. Buildings with front-loading garages flush with front of main building facade must have a covered porch. Other front-loading garages will be evaluated on a case-by-case basis by the RDRC. The visual image of attached garages should be minimized in the streetscape, and the garage proportion should be proportionate to the homes living space. Garage frontage must not exceed 35% of the front façade area This may be accomplished by the use of structural elements, variation within the building facade or decorative elements on the garage facade. Front porches and building entries may protrude in front of the garage as allowed by the lot setback. Detached garages or sheds must be similar in style and color to the primary residence. A detached garage must be placed within the rear yard area of the lot and must be clearly shown on the site plan that is submitted for review. Accessory Buildings shall be of a permanent nature and must be of similar construction, materials and color as the primary residence. All Accessory Buildings must meet required setbacks as specified in this document, and must be screened from public view.

For Medium Density Cluster (MDC) and High Density Residential (HDR), product type will drive garage configuration. Due to the nature of MDC or HDR development a varied use of garage types may be used.

5.4 Porches, Decks and Overhangs •

Covered porches, decks and overhangs are required to provide variety to the building facades of each residence while maintaining architectural integrity and unity within the structure. The appearance of 'add-on' elements should be avoided by integrating these elements into the design of the structure. They should generally be designed to be open and inviting. They should not be long, narrow corridors leading to the front door.

5.5 Driveways •

Driveway locations shall be selected to promote pedestrian friendly pathways. Driveways shall be a minimum depth of 16' from the back of sidewalk in Low and Medium Density areas and should have a maximum slope of 15%. Driveways which have negative slope must show a detail on how the drainage is being routed away from the building and into the drainage system. Shared driveways or lanes are allowed in Medium Cluster areas.

5.6 Mailboxes •

Homes in Medium Cluster and High Density areas are encouraged to receive mail at the designated cluster box locations. Cluster Box locations shall be identified on the Final Improvement Plans.

6.0 ARCHITECTURAL STANDARDS

The architectural patterns within the Rosecrest Development will encompass a wide variety types. Different combinations of material including: stucco, cement fiber siding, masonry, brick, and stone is encouraged be used to complement each and work together to produce a harmonious style. The RDRC shall have broad discretionary powers to reject any housing design the RDRC believes to be materially not compactable with the design philosophy and style of the project. These standards apply to Homebuilders or individual Homeowners.

6.1 Style and Character •

The general style and character of each residence shall be appropriate to the size of the lot, the location within the Development and topography. Homes on sloping lots that result in large retaining walls due to the poor integration of the home and topography may be denied by the RDRC. The incorporation of dormers, porches, wide roof overhangs, iron elements, shutters, accent shingles, and a high percentage of glass and windows are strongly encouraged. Architectural patterns or styles are included in **Exhibit "F"** of this document. These patterns are to be used as a guideline in designing homes for Rosecrest. The RDRC may approve additional building styles based on location and merit.

6.2 Building Size •

The minimum building size for the Rosecrest development shall be regulated based on lot size and land use according to the following chart. Square footage shall be based on above grade livable space. Garage square footage and finished space in accessory buildings may not be included in the total square footage.

Minimum Building Size (in Square Feet)				
Map Designation	Type	Main Floor (sf)	Finished (sf)	Min # of Garages
Low	Rambler	1,800	1,800	2-Car
Low	Two-Story	1,500	2,250	2-Car
Medium	Rambler	1,300	1,300	2-Car
Medium	Two-Story	1,100	2,000	2-Car
Medium Cluster	Two-Story	650	1,200	1-Car
Medium Cluster	Rambler	1,000	1,000	1-Car
High	Multi-Family	650	650	N/A

6.3 Elevations •

The following architectural standards shall apply to all Low Density Residential and Medium Density Residential lots or development. The Owner or Applicant for RDRC approval shall be required to implement these standards.

Architectural standards in the MCD and HDR areas shall conform to the standards listed below where applicable, but may be unique to a project as part of a site plan submittal to the City. The architectural standards in the MDC and HDR areas should be designed to compliment the surrounding neighborhoods and generally should be enforced under a Home Owner Association.

The exterior of each home must meet or exceed the following minimum standards for finish and materials. All windows and doors should be trimmed or set apart from the plane of the facade by accent colors. The use of shutters or similar exterior trim elements is encouraged. All homes shall have a porch unless the RDRC changes the design style.

It is encouraged that the massing of front, rear, and side is broken-up by at least a 3' relief. This is especially important on elevations that significantly affect the view shed.

Front Building Elevation - Brick, rock, or stone must be used for the finish system on the front building façade and must make up a minimum of 30% of

the total area of the front facade. If the home incorporates a front porch across the entire front façade of the house the brick, rock, or stone can be reduced to 10%. Brick or stone shall be used on the front elevation to show significant masonry architectural detail in the form of vertical accents. However, other architectural details may be used in lieu of brick/stone if approved by the RDRC. Manufactured materials may be substituted for real stone products. The remainder of the front elevation may be finished with a combination of stucco, fiber cement material, or brick products. The use of vinyl and aluminum siding is prohibited. The trim should be applied consistently with the architectural style of the home. Trim should be applied so that it adds dimension to the front façade. The use of more than three finish materials in the front elevation is discouraged. All finish materials used and their placement on the facade must be indicated on the elevation rendering when submitted for review to the RDRC. Where living space is added above the garage the front façade must include windows and other treatments to avoid a large blank wall space above the garage doors.

Side Building Elevation – The side of the building shall have the same primary material treatment as the front. Each side elevation must include at least two windows per floor, unless the home contains a wainscot that covers the entire length of the side elevation. In which case, only one window per floor is required. The windows should make up 5% of the side façade for a standard lot. For corner lots the windows should make up 10% of the façade and must have similar window treatments as the front façade windows, i.e. trim and/or shutters.

Rear Elevation – Any home in which the rear of the building is facing a street, or open space the rear elevation must have the same architectural elements as the front elevation. i.e. trim, shutters, rock, stone, masonry base. In other words, it must appear double fronted. The use of trees and landscaping can also be used to help break-up the back wall, but cannot be used exclusively.

6.4 Roofs •

Roof planes for lots on a street without a cul-de-sac shall have a minimum pitch of 6:12 (vertical to horizontal). Lesser pitches may be utilized on small areas of the roof plane such as shed dormers and patio or porch roofs. The design of the roof should appear as an integrated architectural element. Generally, continuous long roof lines are discouraged. 30 year architectural grade roofing is the minimum required for roofs in the Rosecrest Development. Other shingle materials that meet or exceed the minimum requirement may be approved by the RDRC.

A minimum fascia height of 4" shall be required for all homes. These elements shall be finished to match the finish and color or the trim of accent color of the home. Exposed rafters and open soffits shall only be allowed by the RDRC when they relate to the style of the architecture. In such cases, the soffit and rafters must be painted to match the building. Soffit and fascia finish materials must be approved by the RDRC.

6.5 Decks •

The use of decks to extend the living area outdoors is encouraged. Rear decks shall be integrated into the design of the structure. The appearance of a deck supported by 'spindly legs' should be avoided with minimum size support posts of 6"x 6". The RDRC may require the use of structural elements beyond that required by building code to achieve visual balance between the deck and the support structure. The deck must meet the require rear and side yard setbacks as allowed in Section 5.1- "Setbacks".

6.6 Fencing, Walls and Retaining•

Fencing and walls around residential lots is permitted. All fencing within the Rosecrest Community must be constructed of an approved fencing product as stated in the CC&R's. In an effort to maintain and preserve continuity, aesthetics, and property values, only the approved fencing color and product will be allowed by the RDRC. No chain link fencing shall be permitted with the exception of sport court fencing and small dog runs within the individual rear lots. Such fencing shall be screened from public view. All fences on sloping lots must step in four to eight-foot lengths and not be set at an angle.

The following fence standards shall govern for areas along development of front, rear, & side yards where the developer has not installed fencing previously.

Parks and Open Spaces – A 6' privacy fence along all areas adjacent to open space or a three rail fence with 100% finished rear or side yard landscaping is required. 3' rail fence is allowed in parks and trails to delineate open spaces.

Front Yard - Fencing shall not exceed 3' in height in the front yard setback area of the lot. Accent posts or columns may be used that do not exceed 3' provided that the aggregate total of the columns do not exceed 10 percent of the lot frontage. Front yard fencing, walls and screening shall be constructed of the approved fencing products and color. Clear views must be maintained at all intersections. Care must be taken at driveway entrances for traffic safety.

Rear and Side Yard - Approved fencing product and color, 6' in height in the rear or side yard setback area of the lot is acceptable. Accent posts or columns may be used that exceed 6' provided that the aggregate total of the columns do not exceed 10 percent of the rear lot boundary distance. The maximum height of any rear yard, nonhabitable or landscape structure (gazebos, playground equipment, etc.) that is not considered an accessory structure, may not exceed 12'. Side yard fencing on corner lots shall be treated as a front yard fence and must not intrude on visual clear zones for traffic safety at intersections.

Retaining- The use of retaining walls is allowed as long as the wall follows general architectural and engineering standards. Retaining walls should be shown on the site plan as well as a note to identify the type of material(s) to be used for the wall. Walls on individual lots must be located entirely within the boundary of the lot, unless appropriate easements are acquired and recorded. The developer may also use retaining walls to enhance landscaping, provide safe transitions from Open Spaces to Developed Spaces and provide good land planning and drainage throughout the development. All retaining walls shall follow Herriman City Standards.

6.7 Contemporary and Technological Conveniences •

New products and technological conveniences such as satellite dishes may be evaluated and regulated as to location and use by the RDRC. Satellite dishes larger than 24 inches in diameter, and radio and TV antennas taller than 8 feet shall not be permitted on a residential lot. Location, visibility from adjacent properties, color and screening will be considered in granting permission for such devices. Approval of such devices shall be considered a provisional. As such, the permission may be withdrawn by the RDRC and the City due to a change in technology. In such cases, the device must be removed within 30 days of written notification.

6.8 Accessory Commercial Uses •

Home offices are permitted in the Rosecrest Development provided they meet all requirements as specified in the Herriman City Code and a commercial business license has been issued by the city. The use of business signage is prohibited except in specific housing types that are designed for business use, ie live/work units.

7.0 LANDSCAPE STANDARDS

The following landscape standards shall apply to all residential development. The Builder/Applicant for RDRC approval shall be required to implement these

standards as well a landscaping deposit. Failure by the builder/applicant to complete the required landscaping as outlined in section 7.0 will result in loss of the associated escrowed deposit. The escrow requirement may be changed or waived by Rosecrest at its sole discretion a landscape plan must be submitted and approved by RDRC prior to Herriman City issuing a building permit. The RDRC shall have broad discretionary powers in the review and approval of landscaping.

7.1 Landscape Planting •

Each lot or residential parcel shall meet or exceed the following landscape standards:

Front Yard Landscaping - The front yard area (including park strips) of each lot or parcel must be landscaped by the builder/applicant prior to issuance of the 'Certificate of Occupancy' except when 'C of O' occurs during fall or winter months (defined as November 1 to March 31), the builder/applicant shall be required to install front yard landscaping by April 30th of the following spring. It is the builder/applicant's responsibility to ensure that front yard landscaping is installed within the timeframes listed above.

The minimum requirements for front yard landscaping (based on square footage of front yard area) is as follows:

- A. 2 trees (2" caliper min.) located between the walk and home
- B. 3 shrubs (5 gallon) per 600 sf
- C. 1 evergreen shrub (5 gallon) per 600 sf
- D. Minimum 2 Street Trees (2" caliper min.) located in the park-strip or 1 Street Tree (2" caliper min.) per 25' of frontage (i.e. 75' frontage requires 3 trees), whichever is greater.
- E. Sod
- F. Xeriscaping may approved based upon the quality of the plan.

Park Strip Landscaping – All park strip areas adjacent to the front, rear and side yard areas of each lot are to be landscaped by the builder/applicant and maintained by the homeowner. No materials other than the approved trees or grass may be installed in park strip areas. Rocks, gravel, bark, or other types of xeriscaping are not accepted landscape materials for park strip areas. Street trees shall be located within the park strip between the sidewalk and curb. Clear zones for visibility and safety must be considered when locating street trees on corner lots. The side park strips on corner lots must follow the rule of 1 tree every 25'. All street tree species shall be in conformance with the Street Tree List' shown in Exhibit "G". Any tree that is placed in the park strip that is

contrary to the 'Street Tree List' may be removed and replaced with an appropriate tree by the RDRC or the City at the lot builder/applicant's expense.

Rear Yard Landscaping - The rear yard area of each lot or parcel must be landscaped by the builder/applicant within 90 days of the issuance of the 'Certificate of Occupancy'. When 'C of O' occurs during fall or winter months (defined as November 1 to March 31), the builder/applicant shall be required to install rear yard landscaping by April 30th of the following spring.

The minimum requirements for rear yard landscaping are as follows:

- A. 3 Trees (2" cal. min.)
- B. Sod or hydro seeded grass.

The balance of the rear yard shall be landscaped with sod, ground cover, planting beds, or a vegetable garden. Xeriscaping may approved based upon the quality of the plan.

Side Yard Landscaping - The side yard area (including park strips) of each lot or parcel must be landscaped by the builder/applicant prior to the issuance of the 'Certificate of Occupancy'. The minimum requirements for side yard landscaping shall be the installation of sod or hydro seed, ground cover or planting beds. Gravel or rock is not an acceptable landscape material on side yards. Xeriscaping may approved based upon the quality of the plan. On corner lots, the side yard shall be treated as a front yard and landscaped accordingly by the builder/applicant.

All landscaping is required to be installed with an automatic irrigation system. Irrigation systems must provide coverage within the front or side yard park strips. The use of a water conserving drip irrigation system is encouraged.

Landscaping in the MCD and HDR-These areas shall conform to the above listed standards where applicable, but should also provide a landscape plan as part of the site plan submittal to the City. The Landscaping in the MDC and HDR areas should be designed to help soften the density and generally should be maintained under a Home Owners Association. Individual units may be allowed to have a small area of private landscaping.

7.2 Erosion Control Planting or Measures •

All graded areas of any lot may be required to install temporary erosion control plantings or similar erosion control measures in advance of the final landscape

installation. All final landscape plans must address erosion control issues for the home, the lot and any drainage easements that may exist along the lot boundaries. Homeowners may not alter or remove any existing permanent erosion control, drainage system improvements, or any other permanent infrastructure without prior approval from the RDRC. Erosion control plans shall be submitted to the RDRC for review and approval.

All erosion control measures, as shown in the SWPPP and installed by the developer, must be maintained by the builder once ownership transfers. A copy of the SWPPP is available upon written request from the Rosecrest Development office.

7.3 Easements and Rights-of-Way •

Planting shall consist of sod and flowerbeds as desired by the homeowner. Trees must be selected from the approved street tree list and coordinated with the 'Street Tree Master Plan'. Any lot that shares a boundary with an access easement (except for public trail or landscape easements) to a common area or facility must also landscape and maintain the easement. Public trail and landscape easements will be planted and maintained by the Homeowner's Association or an appropriate governmental authority.

7.5 Recommended Plant Materials •

Plantings within the Rosecrest Development common areas and rights-of-way park strips shall be selected from the approved list in Exhibit "A" 'Recommended Plant Materials'. Lot owners should use this list as a guide for individual landscape planting plans within the development. Plants listed as 'Prohibited' are not allowed within the Rosecrest development.

7.6 Maintenance •

Each owner, at the Owner's sole cost shall be responsible for the maintenance and repair of all landscaping on the Owner's lot or parcel. This includes the area between the street curb and park strip behind the curb. All landscaping shall be maintained in good condition including but not limited to irrigation, mowing, fertilization, pruning, pest and disease control, trash removal, fencing, or any other improvement within the landscaped area. Dead, damaged or dying plant materials and damaged or deteriorating structural elements shall be removed or replaced as soon as possible when an unsightly or potentially hazardous condition becomes apparent.

7.7 Weed Control •

Each owner shall be responsible to control weed growth on their lot or parcel. Weeds may not be permitted to exceed 6" in height with the exception of common area parcels that are planted in native vegetation. Any vegetative growth that is deemed to be a fire hazard by the HOA shall be removed within 5 business days at the owner's expense. This requirement shall apply to both developed and undeveloped properties.

8.0 LIGHTING AND MISCELLANEOUS SITE FEATURES

The intent of this section is to provide security and safety for sidewalks, pathways, and streets while preserving the nighttime sky.

8.1 Site Lighting •

The provision of adequate lighting while maintaining the rural nature of the surrounding areas is an important design goal for the Rosecrest Development. Street lights will be installed along major arterial and collector roads. Local roads will be lit per the City street lighting standards. Lighting within the development shall be coordinated according to the following guidelines and fixtures shall be approved by the RDRC.

Pathway Lighting - Major pathways within the development may be illuminated. These light fixtures shall be of a bollard type of light or a low height pole lamp. Illumination levels shall be chosen based on the intended use of the pathway, location within the Development, safety criteria and City approval.

House Lighting - All exterior light fixtures on residences, except those adjacent to front entries and garages, shall be of a type that has a light source shielded from view from the street or neighboring properties. Security lighting installed on a residence shall be concealed from the street view by locating it under eaves or in niches built into the architecture and painted to match the structure. No lighting shall be allowed that produces excessive glare or that shines on another residence or lot. The use of any light source with a color other than white or pale yellow shall be prohibited except for holiday lighting.

Landscape Lighting - Landscape lighting is permitted within each lot as long as it meets the intent of the 'House Lighting' section outlined above. Landscape lighting shall be used for accent lighting and not for general illumination of the residential lot.

Holiday Lighting and Decorations - Holiday lighting and decorations shall not become a nuisance to neighbors. Holiday lighting and decorations may be displayed for a period of (45) days prior to and (30) days after the holiday it is intended for.

8.2 Fixtures and Appurtenances •

All fixtures and appurtenances such as lighting, benches, bike racks, mailboxes and street signs in private areas shall be selected by the RDRC. The use of any fixture within the public areas of Rosecrest must be reviewed and approved by the RDRC.

9.0 SIGNAGE

Signage continuity is important to the long-term values within Rosecrest. The formulation of a Development identity will be governed by the RDRC. All builders shall be required to submit sign programs and designs to the RDRC for approval prior to installation of any sign within the Rosecrest Development.

9.1 Temporary Signage •

Real estate, construction and similar temporary signage shall be governed by the RDRC. Signs must be maintained in a clean and safe manner. Any damaged sign must be repaired or removed immediately. All signage must be approved by the RDRC.

9.2 Flags and Flagpoles •

All flags and flagpoles, whether permanent or temporary, must be approved by the RDRC.

10.0 GENERAL CONDITIONS AND MAINTENANCE

All construction within Rosecrest must adhere to the following rules and regulations. Violations to this section shall be subject to fines as established and authorized in these guidelines by and payable to the RDRC. The payment of any fines shall be the responsibility of the Lot Owner. Any fine that is not paid in the time limit specified may be filed as a lien against the subject lot. Any violation that is not corrected within 30 days may be corrected by the RDRC, at its discretion, and subsequently billed to the applicant or filed as a lien against the property as provided in the CC&Rs recorded on the property.

10.1 Construction Operations •

Construction operations must proceed in an orderly manner within the development. The Contractor and or Owner is responsible for the safety conditions of their property as well as any required liability and disability

insurance coverage. It is the responsibility of the Contractor and or Owner to see that all subcontractors and material suppliers adhere to the rules and regulations as outlined in these regulations. Any construction activity that is halted for a period six (6) months may be subject to review by the RDRC.

Due to the site conditions, blasting utilities and foundation may be required. The contractor shall be permitted to blast as long as he is using a state certified blasting company and he has also obtained all state and local permits.

Onsite grading may be permitted prior to plat recordation with permits and bonding. The contractor is required to submit grading plans to the City for approval, hold a preconstruction meeting, and pay standard city inspection fees, however, grading may proceed at owners own risk.

10.2 Access to Building Sites and Lots •

Owners and contractors may only access building sites by legal points of access such as dedicated streets, rights-of-way, or construction easements. The crossing of adjacent properties, parcels, or lots is prohibited except by written permission of the owner of the adjacent parcel. The use of dirt ramps as a means of accessing lots from the street is strictly prohibited.

No homeowner or contractor may utilize any public or Development open space for access to the rear of the lot for any purpose without prior written permission from the RDRC or other appropriate governmental agency. Permission may be granted for temporary uses or construction purposes only. Permission will not be granted for the purpose of storing vehicles, campers, motor homes, boats or other equipment.

10.3 Dust and Erosion Control •

Each Builder or Contractor shall be required to control all dust during construction. An erosion control plan must be included with the RDRC submittal which follows the SWPPP guidelines as shown in **Exhibit "H"**. This plan is to be implemented for all phases of construction. Failure to adequately control dust and erosion may result in the levying of penalties or fines by the RDRC. The builder or contractor must also follow the requirements as outlined by the State Department of Water Quality.

10.4 Cleanup of Building Sites •

Building sites should be cleaned on a regular basis. Materials should be secured on the site to prevent the blowing of debris and garbage. Commercial dumpsters must be located on the building site or in the right-of-way in front of

the site. A location on an adjacent site under the control of the contractor is also permitted. The contractor shall leave the site in a clean condition upon completion of construction.

10.5 Disposal of Construction Debris •

All construction debris must be removed from the property and disposed of in a legally approved manner. The burning or burial on site of debris and garbage is not permitted.

10.6 Concrete Washout Areas •

Each Applicant shall be required to designate and maintain a concrete washout area on the subject lot. All concrete washouts as a result of construction must be removed from the lot and properly disposed of upon completion of construction.

10.7 Fines and Penalties •

Violation of any section of the Technical Guidelines shall be punishable by fines, penalties, liens, stop work orders and charges for replacement of improvements.

Compare vers 1 & 2 of Doc. 52401

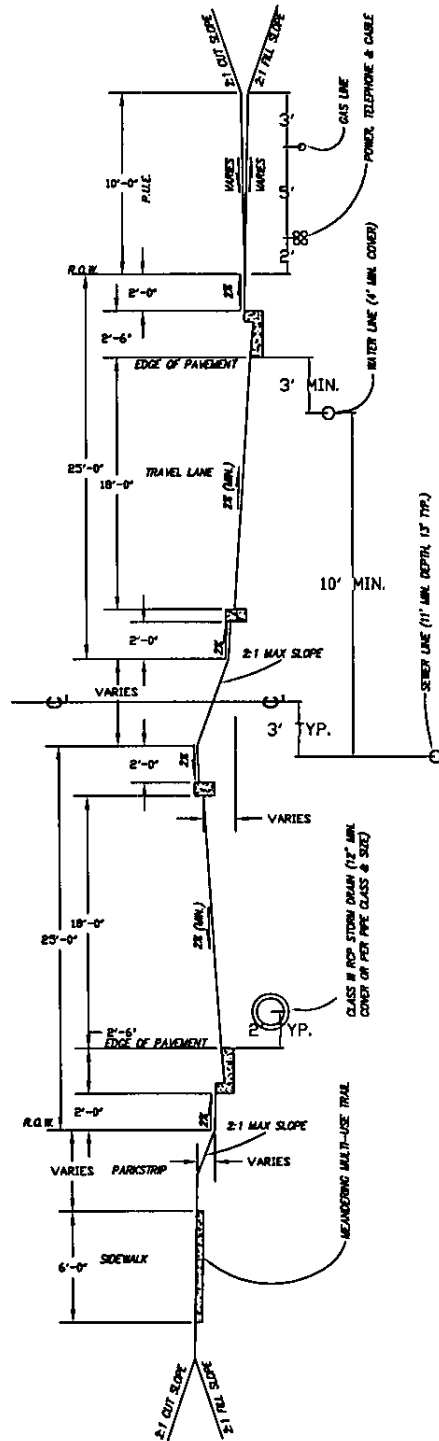
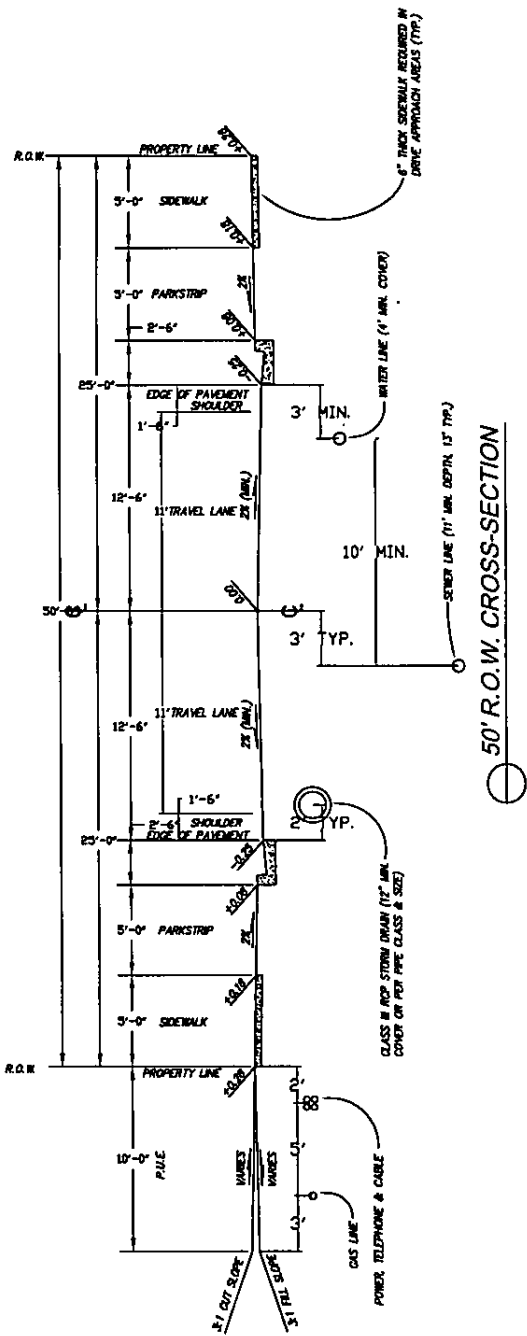
Exhibit A

“Scoring”

Rosecrest Technical Guidelines-Aesthetic Improvement Checklist		
Improvement	Points Possible	Total
Square Footage 1800 sq. ft. or Higher	2	
Roof Pitch 8/12 or Steeper	2	
Hip Roof	1	
3 Gables	1	
Window Treatments (See Description)	3	
Dormers and pop out/bay windows	1	
Glass 25% or more	2	
75%+ front masonry	2	
35%+ side masonry	2	
Garage is detached or set back from façade	3	
Side Turn Garage	3	
Double Doors	2	
Alternate Garage Configurations	3	
Covered Front Porch (See Description)	2	
Wrap Around Front Porch	2	
Rear Deck	1	
Covered Rear Deck/Patio	2	
Built in Front, Rear, or Side Second Story Balcony	2	
Decorative Iron Railings	1	
2 or More Large Yard Trees	1	
Significant Rock Work (See Description)	1	
Water Feature	2	
Planting Beds & Shrubs	1	
Decorative Support Beams	2	
New Plan Introduction	2	
Discretionary Points	3	
GRAND TOTAL	Min. 10	=

Exhibit B "Roadway Cross-Sections"

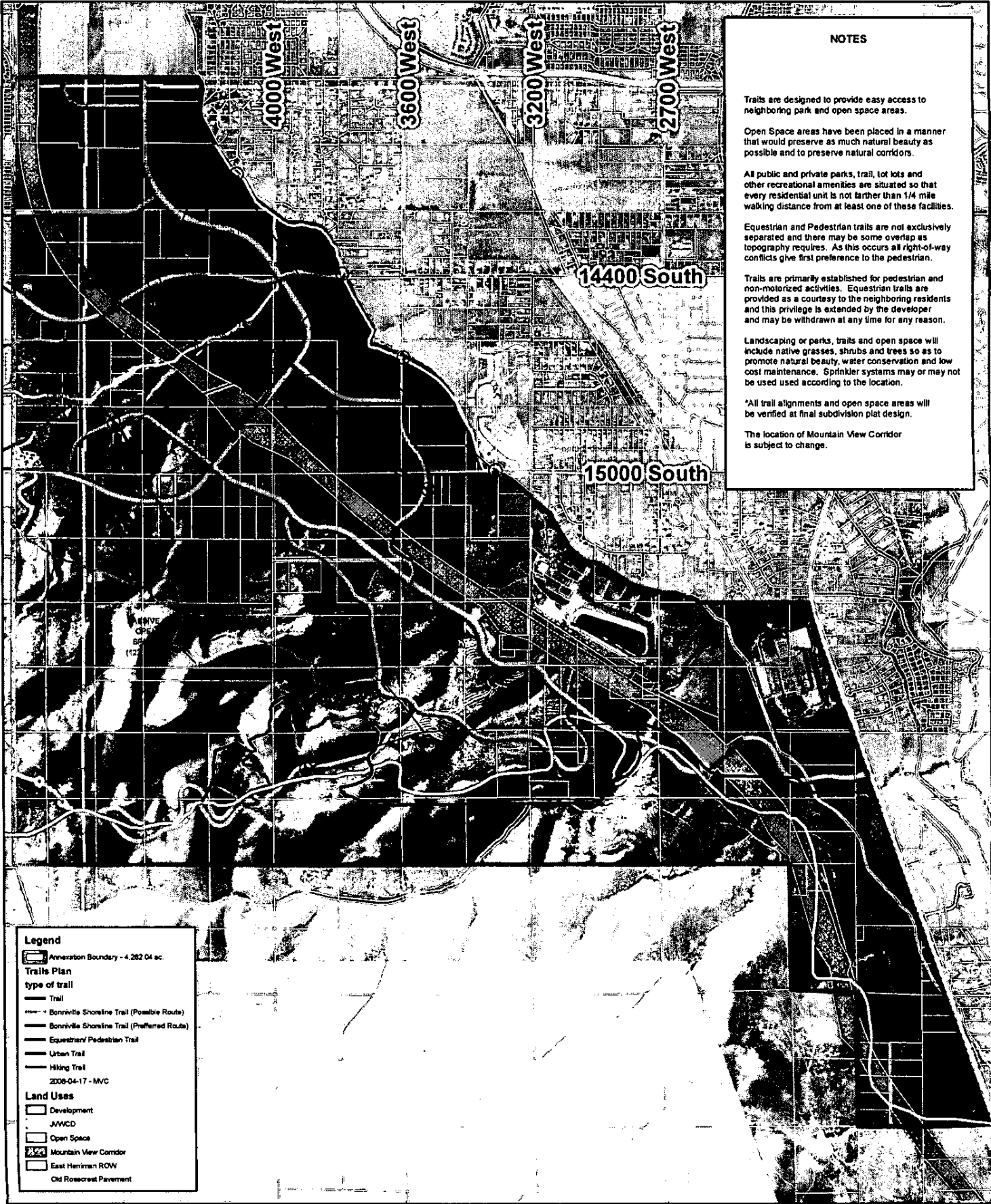
*NOTE: UTILITY PLACEMENTS SHOWN ARE TYPICAL AND USED ONLY AS A GUIDE.



Standard Cross-Sections

GRADE SEPARATED R.O.W. CROSS-SECTION

Note: This cross section assumes a meandering multi-use trail on at least one side of the road that is not part of the public right of way.



NOTES

Trails are designed to provide easy access to neighboring park and open space areas.

Open Space areas have been placed in a manner that would preserve as much natural beauty as possible and to preserve natural corridors.

All public and private parks, trail, lot lots and other recreational amenities are situated so that every residential unit is not farther than 1/4 mile walking distance from at least one of these facilities.

Equestrian and Pedestrian trails are not exclusively separated and there may be some overlap as topography requires. As this occurs all right-of-way conflicts give first preference to the pedestrian.

Trails are primarily established for pedestrian and non-motorized activities. Equestrian trails are provided as a courtesy to the neighboring residents and this privilege is extended by the developer and may be withdrawn at any time for any reason.

Landscaping or parks, trails and open space will include native grasses, shrubs and trees so as to promote natural beauty, water conservation and low cost maintenance. Sprinkler systems may or may not be used according to the location.

*All trail alignments and open space areas will be verified at final subdivision plat design.

The location of Mountain View Corridor is subject to change.

Legend

■ Annexation Boundary - 4,282.04 ac.

Trails Plan

type of trail

- Trail
- - - Bonnaville Shoreline Trail (Possible Route)
- Bonnaville Shoreline Trail (Preferred Route)
- Equestrian/ Pedestrian Trail
- Urban Trail
- Hiking Trail

2008-04-17 - MVC

Land Uses

- Development
- JMWCD
- Open Space
- Mountain View Corridor
- East Herriman ROW
- Old Roadway Pavement

Exhibit C "Open Space & Trails Map"

0.051 0.20 30.40.5
 Miles



Exhibit D

“Setbacks”

Primary Structures – (Measured to the Public Right-of –Way)

Map Designation	Lot Size	Front Yard	Rear Yard	Side Yard	Corner Yard	Side Turned Garage Side Yard	Accessory Building Size
Low	8,500-17,999 s.f.	28'	28'	8' min./ 16' Total	20'	N/A	1,200 s.f.
Low	18000+ s.f.	30'	30'	10' min./ 24' Total	20'	8' min./ 24' Total	1,200 s.f.
Low	43,560 s.f. (Transition)	32'	30'	12' min.	20'	N/A	1,200 s.f.
Medium	4,000-8,000 s.f.	10' (20' to Garage)	15'	5' min./ 10' Total	18'	N/A	1,200 s.f.
Medium	8,001-10,000 s.f.	20'	20'	5' min./ 12' Total	18'	N/A	1,200 s.f.
Medium	10,001-12,000 s.f.	25'	25'	6' min./ 15' Total	20'	N/A	1,200 s.f.
Medium	12,001+ s.f.	28'	28'	8' min./ 18' Total	20'	6' min./ 18' Total	1,200 s.f.
Medium Cluster	N/A	18' w/ Front Driveway/ 15' w/ Alley or Lane	15' from adjacent building unless attached	15' from adjacent building unless attached	20'	N/A	N/A
High	Public Right- of-Way	15' (20' to Garage)	15'	15'	18'	N/A	N/A
High	Private (Measured from TBC)	8' to Garage	15'	10'	18'	N/A	N/A
High	Public Open Space	8'	12'	6'	N/A	N/A	N/A
All Densities	Accessory Building	6' from main structure	10'	5'	N/A	N/A	N/A
All Densities	Front Porches	Less 4' of Setback (not in MDC)	N/A	N/A	N/A	N/A	N/A
All Densities	Rear Decks (2' Above Grade)	N/A	15'	6'	N/A	N/A	N/A
All Densities	Rear Decks (2' Above Grade) Adjacent to Open Space	N/A	5'	6'	N/A	N/A	N/A
All Densities	Patios, Decks, & Walks at Grade	N/A	4'	4'	N/A	N/A	N/A
All Densities	Public Utility Easement	10'	10'	5'	10'	N/A	N/A

EXHIBIT E

FRONT LOAD 2 CAR "GARAGE EXAMPLES"

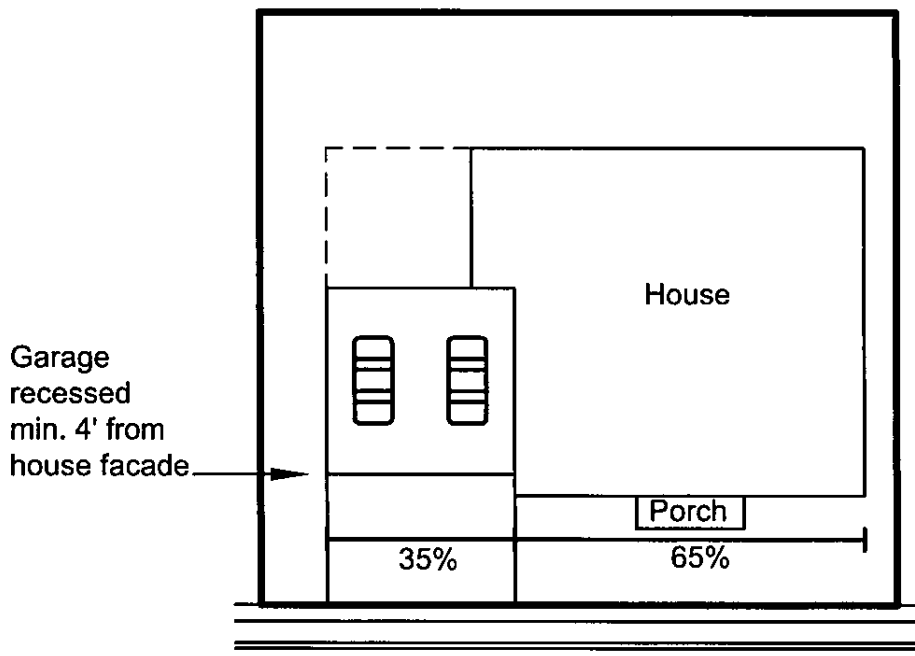
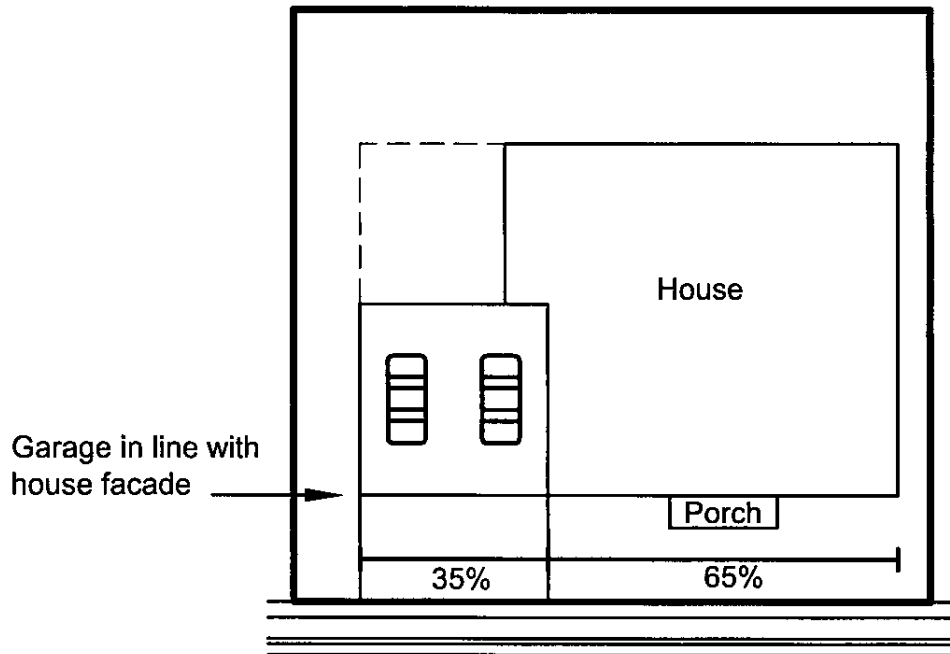


EXHIBIT E

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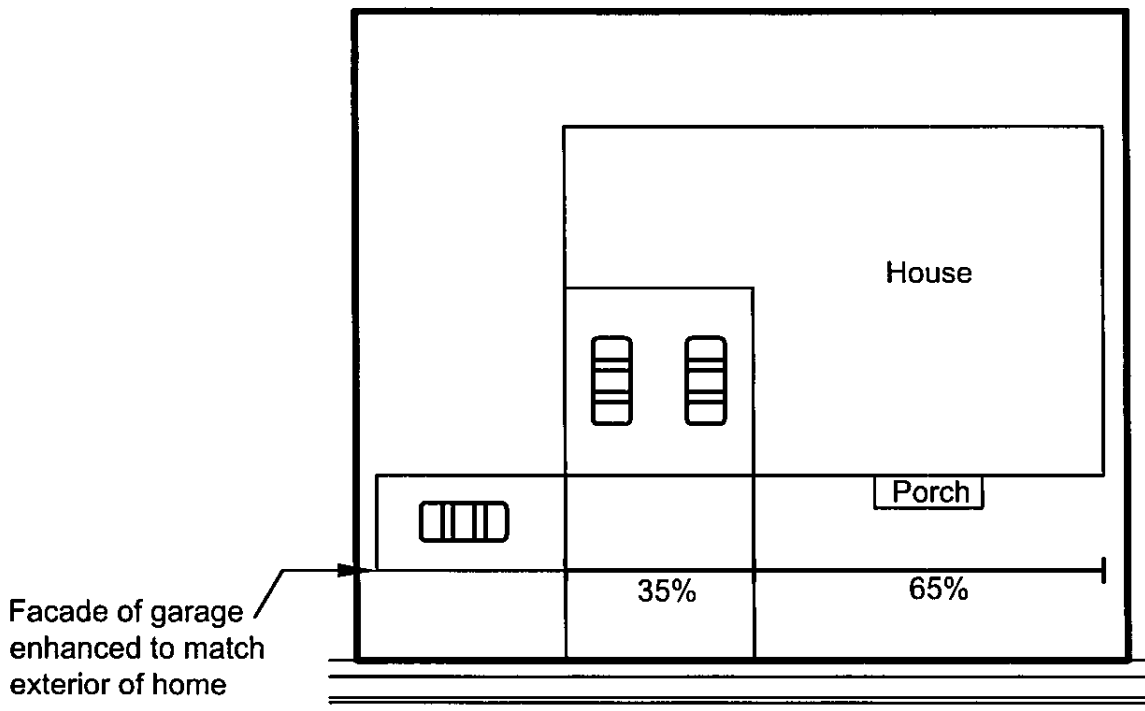
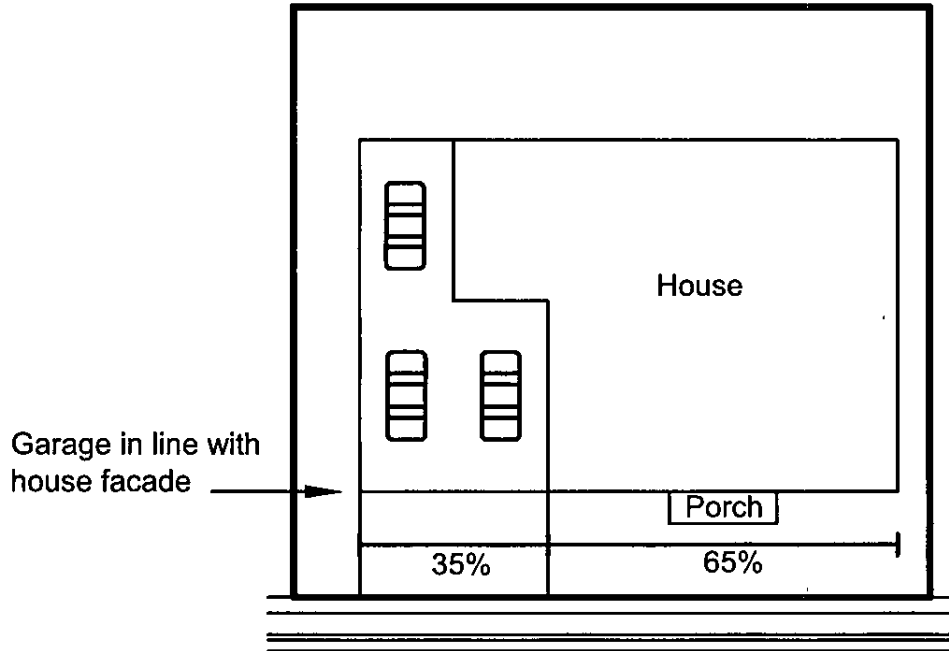


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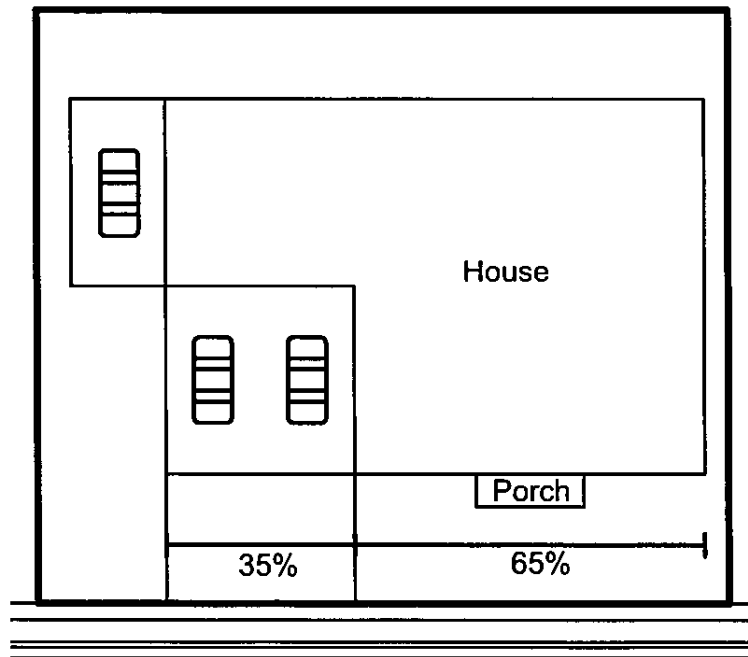
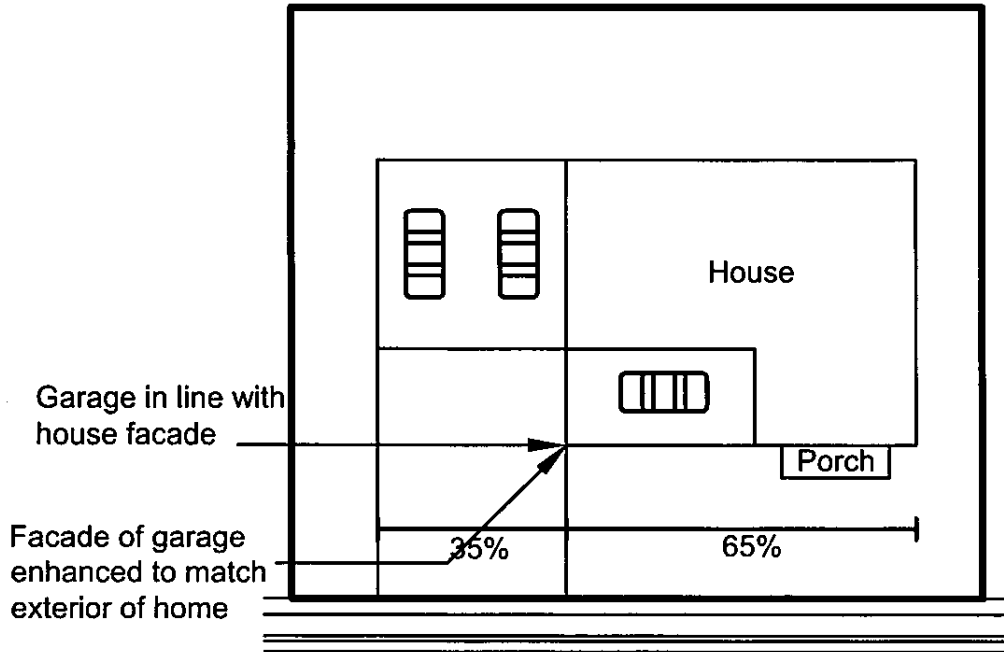


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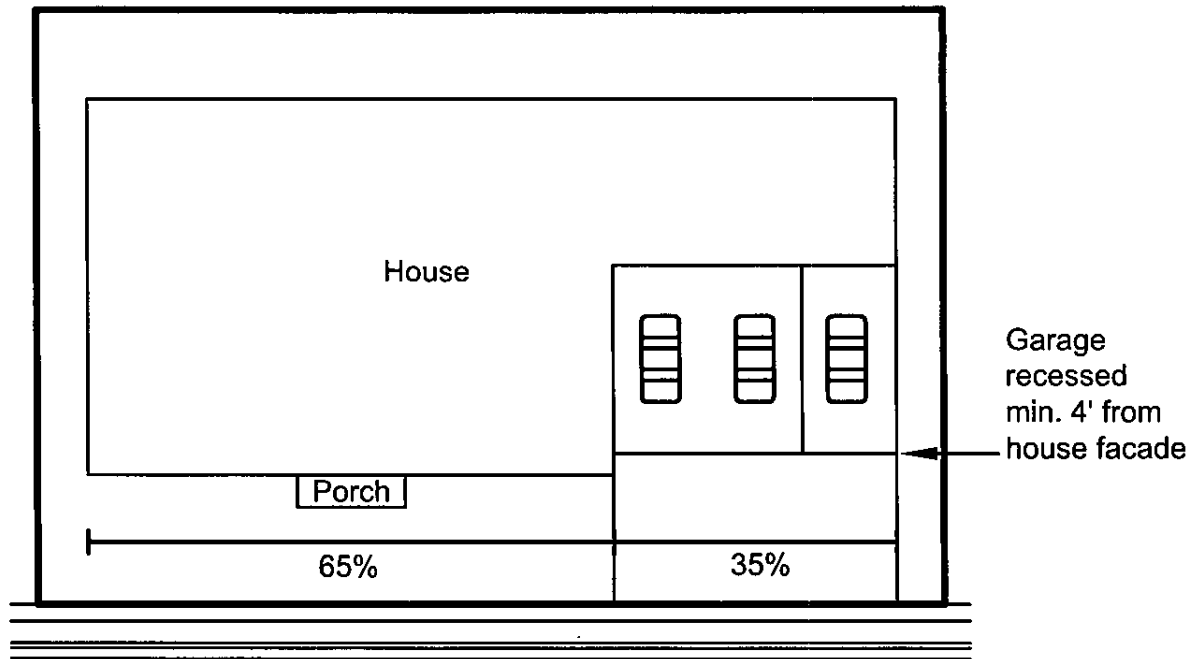
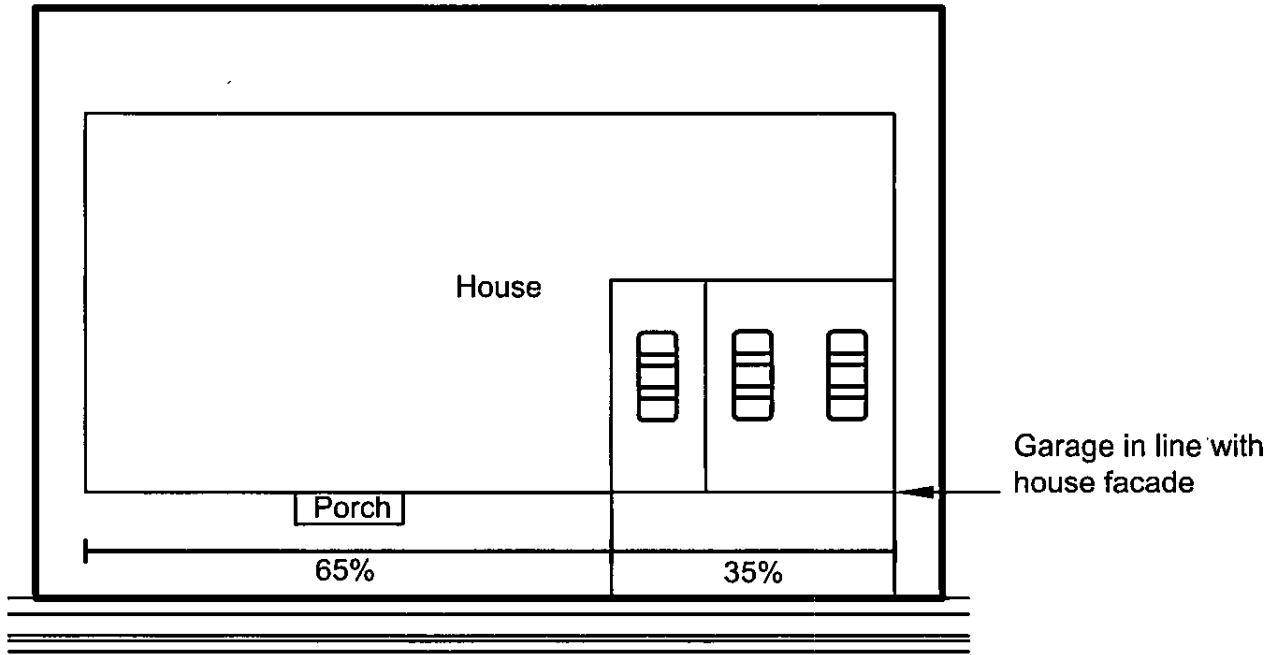


EXHIBIT E

TWO CAR SIDE TURNED "GARAGE EXAMPLES"

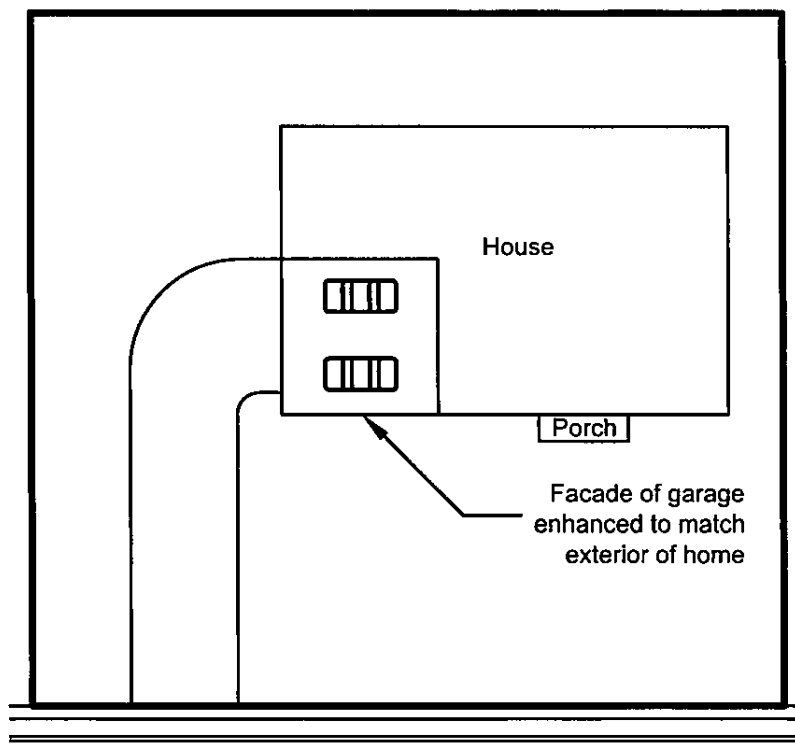
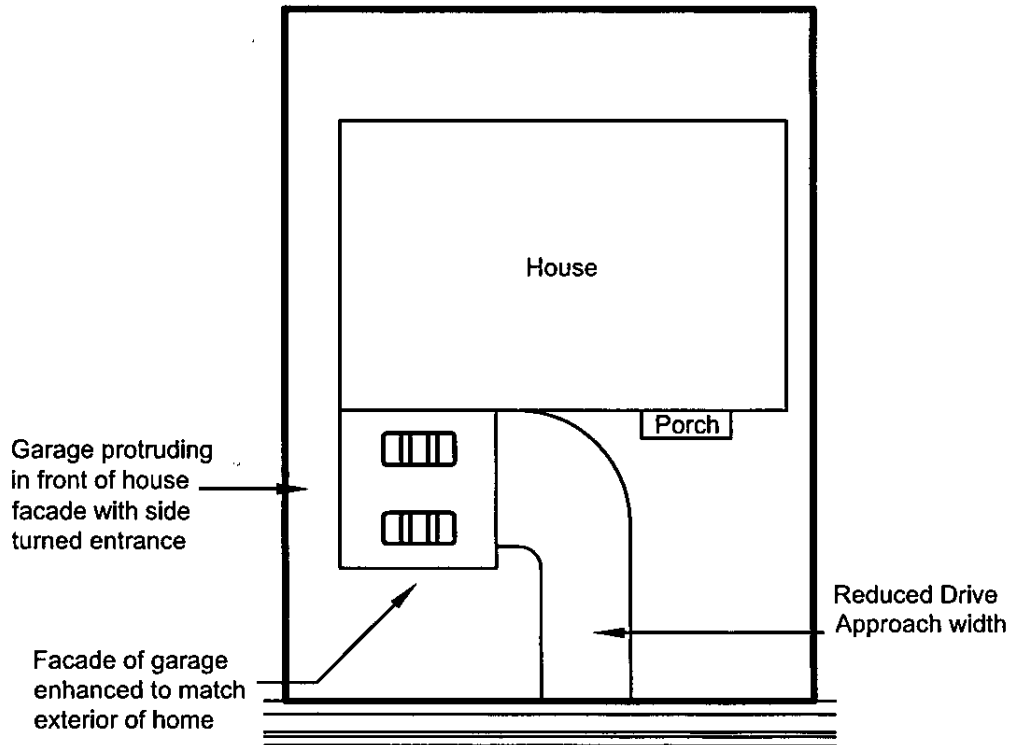


EXHIBIT E

THREE CAR SIDE TURNED "GARAGE EXAMPLES"

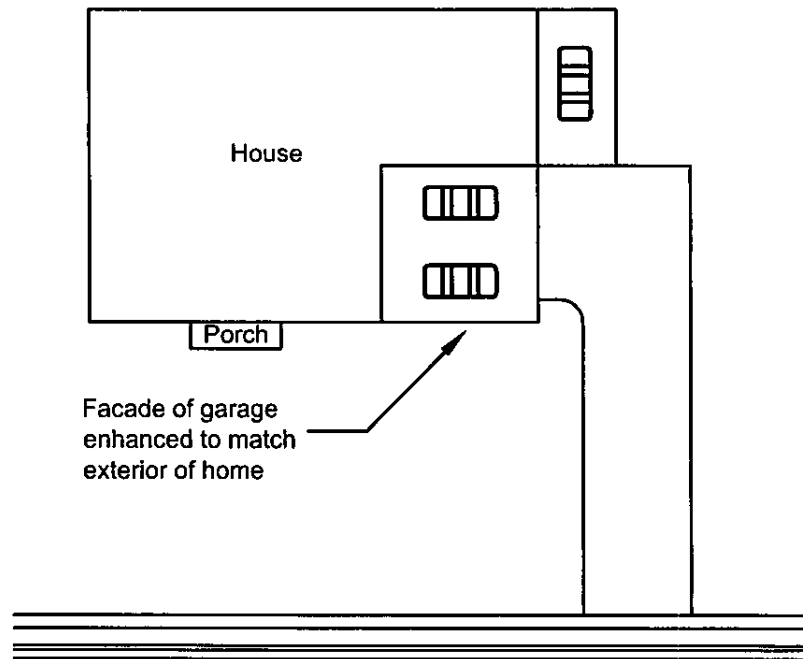
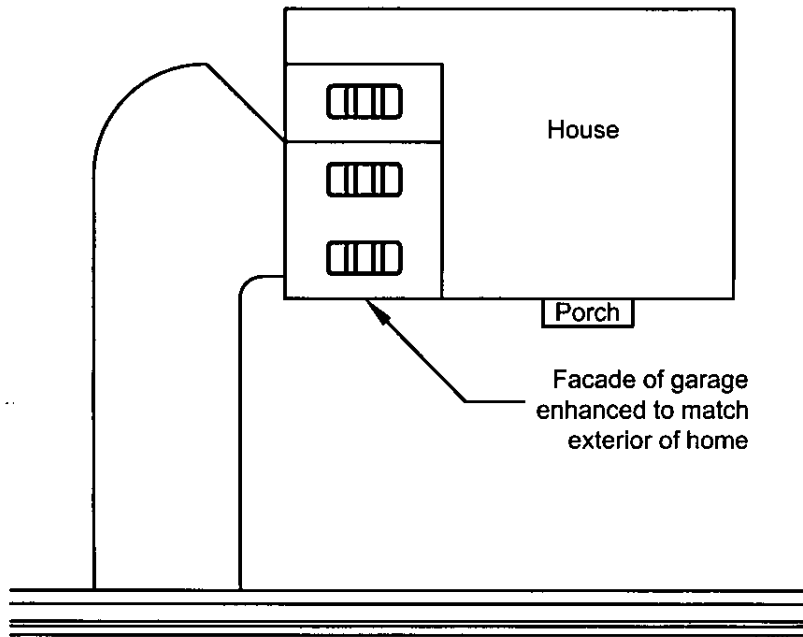


Exhibit F

Architectural Example pictures to be added

ATTACHMENT "G" – RECOMMENDED STREET TREES

COLLECTOR STREET TREES

SPACING • MINIMUM - 45' O.C. / MAXIMUM – 65' O.C.

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ACER P. 'EMERALD QUEEN'	NORWAY MAPLE
ACER PSEUDOPLATANUS	SYCAMORE MAPLE
AESCULUS x C. 'FT. McNAIR'	HORSECHESTNUT
CELTIS OCCIDENTALIS	HACKBERRY
FAGUS SYLVATICA	EUROPEAN BEECH
FRAXINUS P.L. 'CIMMZAM'	CIMMERON GREEN ASH
GLEDITSIA T. 'SKYLINE'	SKYLINE HONEYLOCUST
QUERCUS MACROCARPA	BURR OAK
QUERCUS RUBRA	RED OAK
TILIA C. 'GREENSPIRE'	GREENSPIRE LINDEN

LOCAL AND NEIGHBORHOOD STREET TREES

SPACING • MINIMUM – 30' O.C. / MAXIMUM – 50' O.C.

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ACER CAMPESTRE	HEDGE MAPLE
ACER PLATANOIDES	NORWAY MAPLE
AESCULUS x CARNEA	HORSECHESTNUT
CARPINUS BETULUS 'FASTIGIATA'	PYRAMIDAL HORNBEAM
CELTIS OCCIDENTALIS	HACKBERRY
CRATAEGUS OXYCANTHA	ENGLISH HAWTHORN
CRATAEGUS PHAENOPYRUM	WASHINGTON HAWTHORN
FRAXINUS AMERICANA	WHITE ASH
FRAXINUS PENNSYLVANICA	GREEN ASH
GINKGO B. 'FAIRMONT'	MAIDENHAIR TREE
GLEDITSIA T. 'IMPERIAL'	IMPERIAL HONEYLOCUST
MALUS 'HOPA'	HOPA CRAB
PYRUS CALLERYANA 'BRADFORD'	BRADFORD FLOWERING PEAR
QUERCUS MACROCARPA	BURR OAK
TILIA A. 'REDMOND'	REDMOND LINDEN
TILIA C. 'GREENSPIRE'	GREENSPIRE LINDEN

Evergreen Trees are not permitted to be placed within the park strips or any other area that lies between a walkway and the curb within the Rosecrest Community

RECOMMENDED PLANTING LIST

EVERGREEN TREES

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ABIES CONCOLOR	CONCOLOR (WHITE) FIR
ABIES LASIOCARPA	SUB-ALPINE FIR
PICEA PUNGENS	COLORADO GREEN SPRUCE
PICEA PUNGENS 'GLAUCA'	COLORADO BLUE
PINUS MUGO 'PUMILIO'	DWARF MUGO PINE
PINUS NIGRA	AUSTRIAN PINE
PINUS SYLVESTRIS	SCOTCH PINE

DECIDUOUS TREES

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ACER CAMPESTRE	HEDGE MAPLE
ACER GLABRUM	ROCKY MOUNTAIN MAPLE
ACER GRANDIDENTATUM	BIGTOOTH MAPLE
ACER PALMATUM	JAPANESE MAPLE
ACER PLATANOIDES *	NORWAY MAPLE
AESCULUS x CARNEA *	HORSECHESTNUT
BETULA OCCIDENTALIS	WATER BIRCH
CARPINUS BETULUS 'FASTIGIATA'	PYRAMIDAL HORNBEAM
CELTIS OCCIDENTALIS	HACKBERRY
CRATAEGUS OXYCANTHA	ENGLISH HAWTHORN
CRATAEGUS PHAENOPYRUM *	WASHINGTON HAWTHORN
FAGUS SYLVATICA *	EUROPEAN BEECH
FRAXINUS AMERICANA *	WHITE ASH
FRAXINUS PENNSYLVANICA *	GREEN ASH
GLEDITSIA TRICANTHOS *	THORNLESS HONEYLOCUST
MALUS 'HOPA'	HOPA CRAB
PLATANUS x ACERIFOLIA *	LONDON PLANE TREE
POPULUS ALBA 'PYRIMIDALIS'	BOLLEANA POPLAR
POPULUS DELTOIDS 'SOUIXLAND'	COTTONLESS COTTONWOOD
POPULUS TREMULOIDES	QUAKING ASPEN
PRUNUS CERA. 'THUNDERCLOUD'	THUNDERCLOUD PLUM
PRUNUS CISTENA	CISTENA PLUM
PRUNUS SUBHIRTELLA *	FLOWERING CHERRY
PYRUS CALLERYANA 'BRADFORD' *	BRADFORD FLOWERING PEAR
QUERCUS GAMBELII	GAMBEL (SCRUB) OAK
QUERCUS MACOCARPA *	BURR OAK
SALIX M. 'UMBRACULIFERA'	GLOBE WILLOW
TILIA CORDATA *	LITTLELEAF LINDEN

* DENOTES POTENTIAL STREET TREE VARIETY

EVERGREEN SHRUBS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ILEX AQUIFOLUM 'SAN GABRIEL'	GREEN ENGLISH HOLLY
JUNIPERUS S. 'TAMARISCIFOLIA'	TAM JUNIPER
JUNIPERUS SABINA 'BUFFALO'	BUFFALO JUNIPER
JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER
MAHONIA A. 'COMPACTA'	COMPACT OREGON GRAPE
PHOTINIA FRASERI	FRASER PHOTINIA
PRUNUS LAUROCERASUS	ENGLISH LAUREL
TAXUS MEDIA 'HECKSII'	HICKS YEW

DECIDUOUS SHRUBS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
AMELANCHIER UTAHENSIS	UTAH SERVICEBERRY
ARONIA ARBUTIFOLIA	RED CHOKEBERRY
CORNUS STOLONIFERA	RED TWIG DOGWOOD
COTONEASTER APICULATA	CRANBERRY COTONEASTER
BUDDLEIA DAVIDII	BUTTERFLY BUSH
EUONYMUS ALATUS COMPACTA	DWARF WINGED EUONYMUS
FORSYTHIA I. 'LYNWOOD GOLD'	LYNWOOD GOLD FORSYTHIA
POTENTILLA FRUTICOSA SP.	SHRUBBY CINQUEFOIL
PRUNUS VIRGINIANA	CHOKECHERRY
RHUS TRILOBATA 'WASATCH'	WASATCH OAKBRUSH SUMAC
RHUS TYPHINA	STAGHORN SUMAC
ROSA RUGOSA	RUGOSA ROSE
SPIRAEA B. 'ANTHONY WATERER'	ANTHONY WATERER SPIRAEA
SPIRAEA VANHOUTTEI	BRIDAL WREATH SPIRAEA
SYRINGA VULGARIS	COMMON PURPLE LILAC
VIBURNUM SPECIES	VIBURNUM
YUCCA FILAMENTOSA	YUCCA

GROUND COVERS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
EUONYMUS FORTUNEI 'COLORATUS'	WINTER CREEPER
HEDERA HELIX	ENGLISH IVY
LYSIMACHIA NUMMULARIA	CREEPING JENNY
MAHONIA REPENS	CREEPING MAHONIA
POTENTILLA VERNA	CINQUEFOIL
SEDUM UTAH	UTAH GREEN SEDUM
VINCA MINOR	DWARF PERIWINKLE

PERENNIAL FLOWERS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ACHILLEA F. 'CORONATION GOLD'	GOLD YARROW
ACHILLEA MILLEFOLIUM 'CHERRY'	CHERRY YARROW
ALCEA ROSEA 'CHATERS MIXED'	HOLLYHOCK

AQUILEGIA 'BIEDERMEIER'
 AQUILEGIA 'McKANA GIANT'
 ARABIS CAUCASICA 'SNOW CAP'
 ASTER BONNEY BLUE
 ASTILBE 'BRIDAL VEIL'
 ASTILBE 'FANAL'
 AURINIA SAXATILE 'COMPACTA'
 CAMPANULA ROTUNDIFOLIA 'OLYMPICA'
 CENTAUREA MONTANA 'BLUE'
 CHRYSANTHEMUM MAXIMUM 'ALASKA'
 COREOPSIS GRANDIFLORA 'SUNRAY'
 COREOPSIS VERTICILLATA 'MOONBEAM'
 DELPHINIUM PACIFIC GIANT
 DIANTHUS DELTOIDES 'BRILLIANT'
 DIANTHUS PLUMARIUS 'ZING ROSE'
 ECHINACEA PURPUREA
 ECHINACEA PUPUREA 'ALBA'
 GAILLARDIA GRANDIFLORA 'GOBLIN'
 HEMEOCALLIS
 HOSTA 'ROYAL STANDARD'
 IMPERATA CYLINDRICA 'RED BARON'
 LAVANDULA A. 'HIDCOTE BLUE'
 LUPINUS 'RUSSELL HYBRIDS'
 PAPAVER ORIENTALE
 PENSTEMON 'PRAIRIE FIRE'
 POLYSTICHUM SETIFERUM ANGULARE
 RUDBECKIA FULGIDA 'GOLDSTUM'
 VERONICA SPICATA 'RED FOX'
 VERONICA TEUCRIUM 'BLUE SPIRES'

COLUMBINE
 COLUMBINE
 WHITE ROCK CRESS
 MICHAELMAS DAISY
 GOAT'S BEARD
 GOAT'S BEARD
 BASKET OF GOLD ALLYSSUM
 BLUE BELLS OF SCOTLAND
 BACHELOR BUTTON
 SHASTA DAISY
 TICKSEED
 TICKSEED
 LARKSPUR
 MAIDEN PINKS
 ZING ROSE COTAGE PINK
 PURPLE CONEFLOWER
 CONEFLOWER
 BLANKET FLOWER
 DAYLILY
 PLANTAIN LILY
 JAPANESE BLOOD GRASS
 ENGLISH LAVENDER
 LUPINE
 ORIENTAL POPPY
 PENSTEMON
 ALASKAN FERN
 BLACK EYED SUSAN
 SPIKE SPEEDWELL
 HUNGARIAN SPEEDWELL

PROHIBITED PLANTS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
ACER NEGUNDO	BOX ELDER
ELEAGNUS ANGUSTIFOLIA	RUSSIAN OLIVE
POPULUS SPECIES	COTTON FORMING
	COTTONWOOD
GINKGO – FEMALE CULTIVARS	FRUITING FEMALE GINKGO

*** ANY PLANT OR SPECIES LISTED BY THE STATE OF UTAH AS A 'NOXIOUS WEED'.**

EXHIBIT H

ROSECREST

Home Builder's Soil Erosion Control Guidelines

All builders shall be required to file a UPDES permit with the State of Utah as required by State Law. Each Builder must have a Storm Water Prevention Plan which must incorporate the items as outlined in this exhibit. The UPDES permit can be done online at the following URL:

http://www.waterquality.utah.gov/updes/Updes_f.htm

Builders are required to prevent soil erosion from the lots that they have purchased. Builders shall implement measures to prevent soil erosion during construction. Activities that will be managed, depending on the slope and nature of the lot, during construction include, but are not limited to the following:

1. Grade lot so that drainage will follow the drainage easements between lots as specified on the grading and drainage sheets of the Construction Drawings for the Platted development. Each lot shall be graded so that drainage will follow the direction of the drainage arrows shown on the grading and drainage sheets.
2. Direct downspouts from gutters so that water runs away from bare soil on your lot. Flexible plastic pipe shall be utilized to direct the water away from bare soil towards the street.
3. Install and maintain a temporary silt fence barrier, sand bags, fiber filter rolls or Filtrex Filtersoxs around your lot. These products control sediment from eroding onto other lots and into the street. The chosen product shall be placed on the sides of the lot that front a street(s) and along property boundaries that slope onto other lots. The erosion control measure shall be placed next to the back of curb where the lot fronts a street. Figure 1 shows a typical lot on a hillside and the location of where these erosion control products shall be placed.
 - a. A silt fence is a black, woven plastic material with wooden stakes. The fence shall be trenched 6 inches into the ground and extend approximately 18 inches above ground. The fence is stabilized with wood stakes that are placed a maximum of 6 feet apart. Figure 2 shows how a typical silt fence is installed.
 - b. Sand bags are burlap or plastic bags filled with sand. The bags when filled are approximately 10 to 12 inches wide and 18 inches long. The bags are placed next to each other end on end two bags high and extend along the property boundary. Figure 3 shows how sand bags are placed to prevent sediment from leaving a lot.

- c. Fiber filter rolls are typically 8-9 inches in diameter and 25 feet long. They are placed in a small trench, 3 to 4 inches deep and staked with 18 or 24 inch wood stakes at four foot on center. The ends of adjacent fiber filter rolls are abutted to each other snugly. Figure 4 shows how a fiber filter roll is installed.
- d. Filtrex SiltSoxx™ are sediment-trapping devices using Filtrex FilterMedia™ applied with a pneumatic blower device or equivalent. The SiltSoxx™ are typically 8 or 12 inches in diameter and staked with 18 or 24 inch wood stakes at ten foot on center. Figure 5 is an example of Filtrex SiltSoxx™.

The chosen sediment control measure shall be installed per the manufacturer's specifications. If the erosion control product is removed during the daily construction process it must be reinstalled at the end of each work day.

- 4. Maintain a single construction access to lot for vehicle entrance. The access shall be maintained to prevent sediment from entering the street. Sand bags shall be placed approximately 10 feet downstream from the construction access and as described in Figure 1.

Rosecrest will work with each builder to ensure that soil erosion is controlled within each lot that is under construction. Erosion control measures will be checked and monitored by Rosecrest and Herriman City.

Erosion Control is the responsibility of the builder during construction, and then transfers to the homeowner during occupancy. If a builder or homeowner fails to comply with these guidelines fines can be assessed and the builder or homeowner will be responsible for damage due to uncontrolled run-off. Remember the best way to control run-off is by landscaping. The deadlines on landscaping can be found in the design guidelines, which is a part of the CCR's for each plat.



FIGURE 3 - SAND BAGS



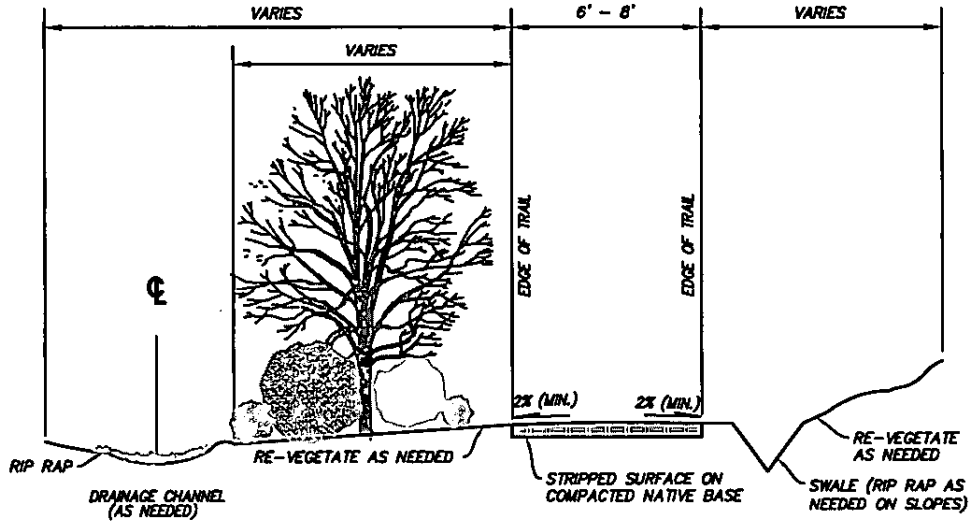
FIGURE 4 - FILTER FIBER ROLL



FIGURE 5 - Filtrex SiltSoxx™

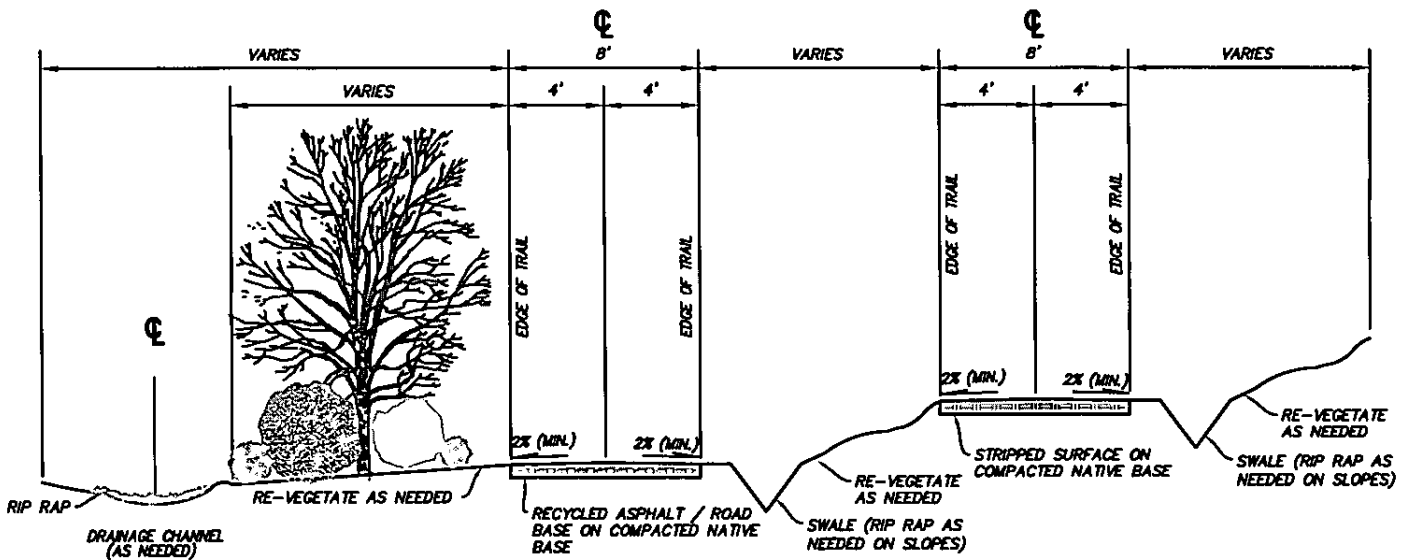
EXHIBIT I

"Trail Cross-Sections"



B 6' - 8' TRAIL CROSS-SECTION
VAR SCALE: N.T.S.

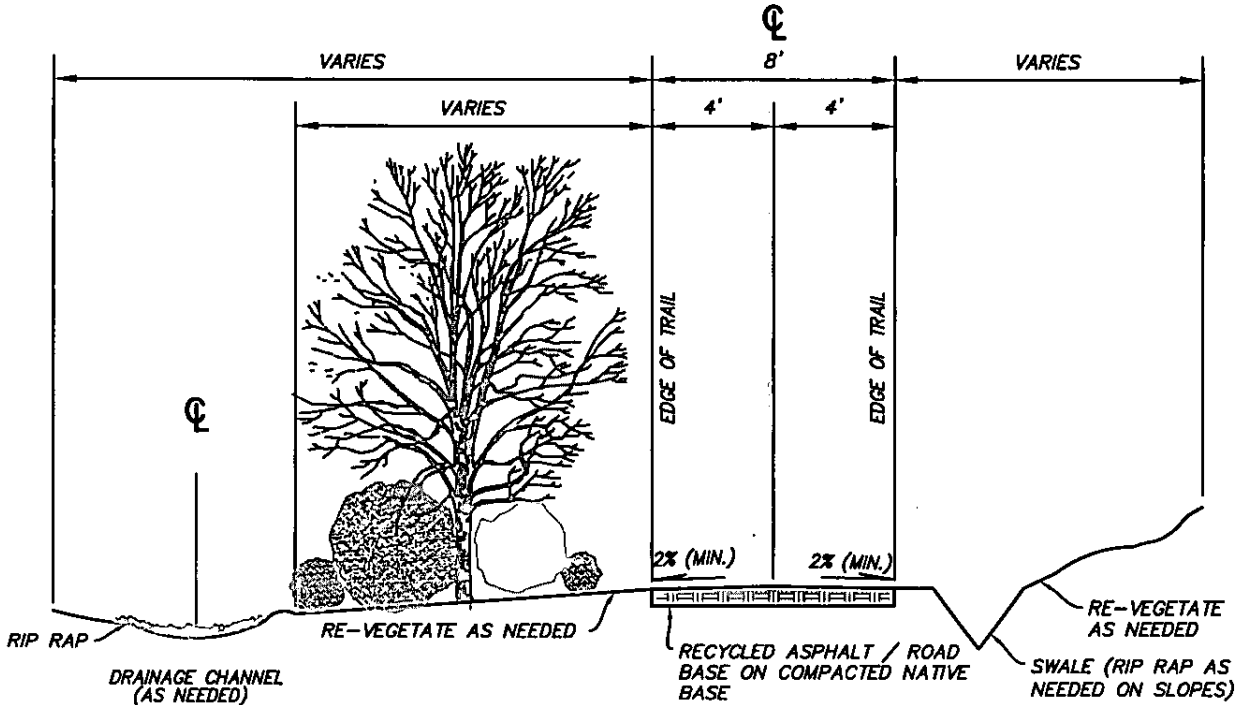
EQUESTRIAN / PEDESTRIAN



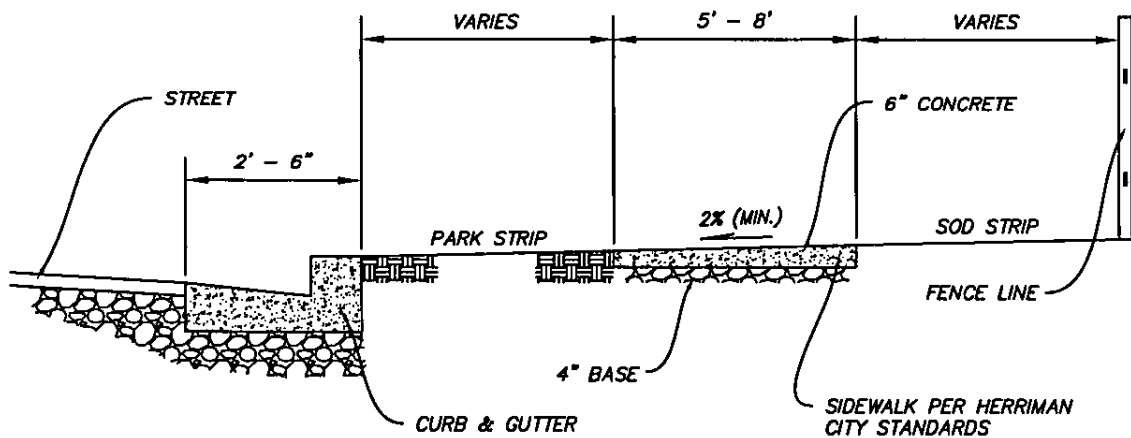
B EQUESTRIAN & PEDESTRIAN TRAIL CROSS-SECTION
VAR SCALE: N.T.S.

EXHIBIT I

"Trail Cross-Sections"



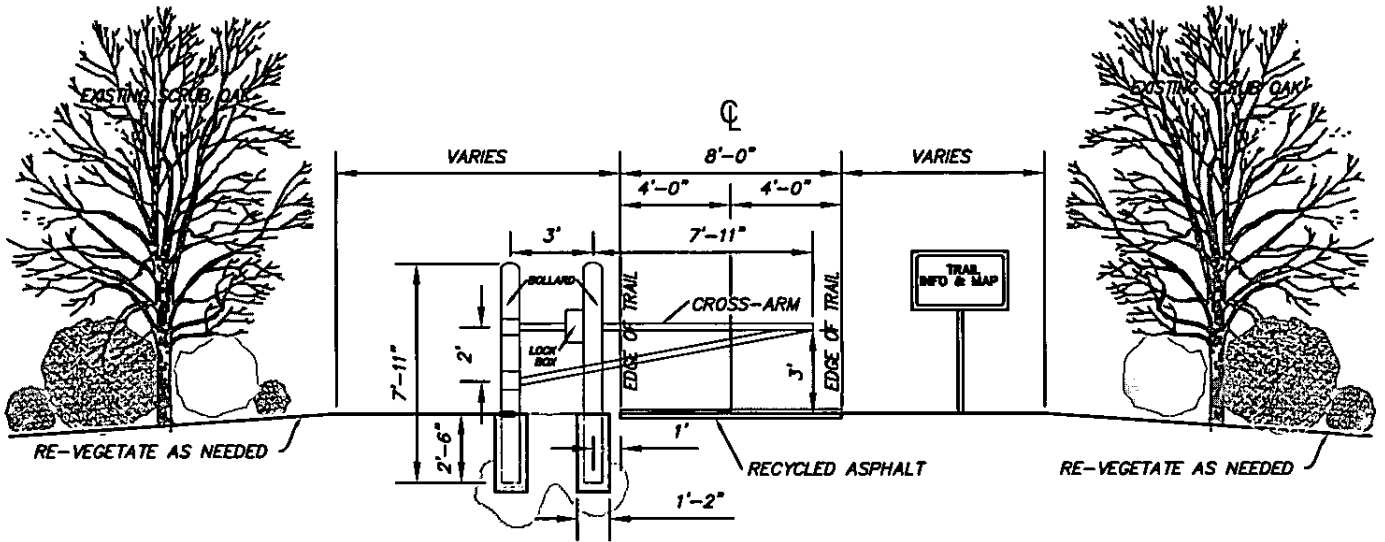
(B) 8' URBAN ASPHALT TRAIL CROSS-SECTION
VAR SCALE: N.T.S.



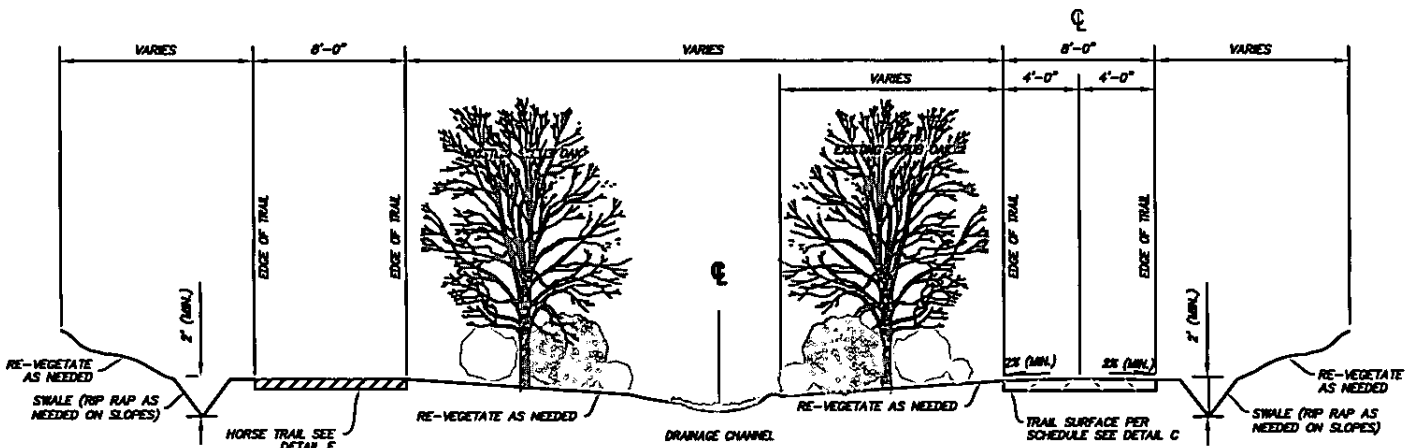
(B) 5' - 8' URBAN ASPHALT TRAIL CROSS-SECTION
VAR SCALE: N.T.S.

EXHIBIT I

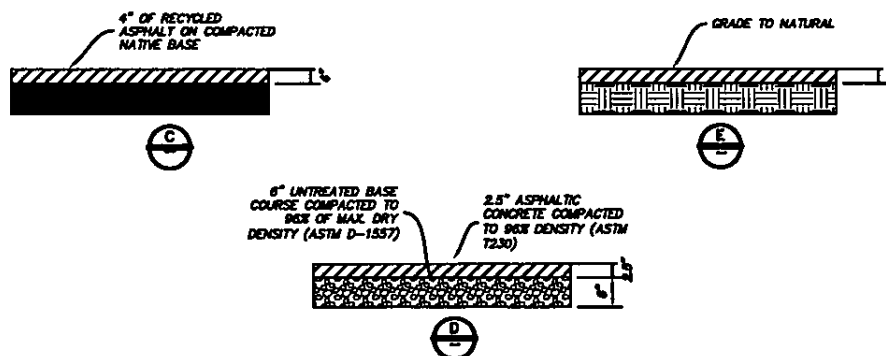
"Trail Cross-Sections"



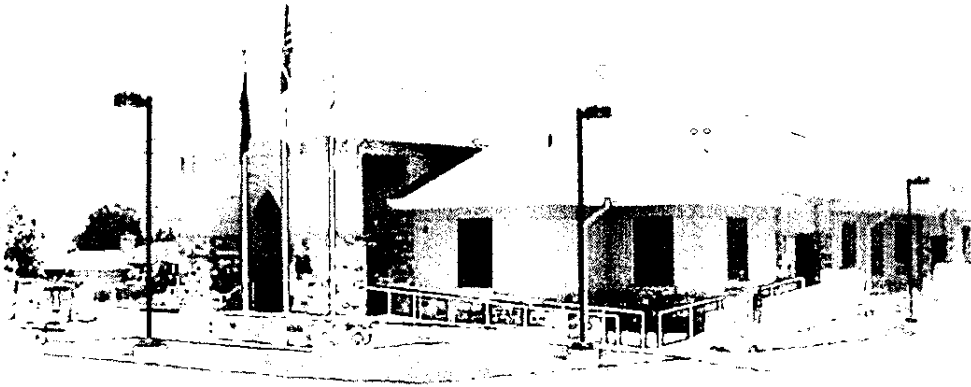
B TRAIL ACCESS POINT CROSS-SECTION
SCALE: N.T.S.



A 8' TRAIL CROSS-SECTION
SCALE: N.T.S.



**HERRIMAN CITY
DEVELOPMENT STANDARDS,
ENGINEERING REQUIREMENTS
AND
SUPPLEMENTAL SPECIFICATIONS
FOR
PUBLIC WORKS PROJECTS**



**5th EDITION
2008
Amended**

Founded 1857


Herriman
19011 S. Pioneer St. • Herriman, UT 84096

November 2008

INTRODUCTION

This manual, in conjunction with the latest edition of the APWA manual of standard plans and the currently adopted City ordinances, establishes requirements for the preparation, processing and approval of improvement plans for public works projects. Preparation of improvement plans and specifications that conform fully with the requirements outlined in this manual will expedite the processing, reviewing, and approval of the submitted improvement plans by Herriman City.

All local, Municipal and State laws and rules and regulations governing or relating to any portion of this work are to be incorporated into and made a part of all plans and specifications and their provisions shall be carried out by the Developer and Contractors. Anything contained in these specifications shall not be construed to conflict with any of the ordinances and regulations of the City; however, these specifications take precedence over the requirement of said rules and regulations when they describe materials, workmanship or construction of a higher standard or larger size.

It is the intent of Herriman City to continually improve this manual. On a periodic basis, proposed supplements, revisions and amendments will be reviewed and adopted.

Copies of this manual are available for purchase from Herriman City, 13011 South Pioneer Street, Herriman, Utah 84096, during normal working hours.

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Escrow
Irrevocable Letter of Credit
Cashier’s Check

**SECTION 1: GENERAL APPROVAL
PROCEDURE**

SECTION 1: GENERAL APPROVAL PROCEDURE

SECTION 1: GENERAL APPROVAL PROCEDURE

This section provides general guidance for the City's approval procedure. The actual process depends on the unique situation of each development or project. Steps may be combined, added, replaced or eliminated as deemed necessary by the City. Additional information may also be required.

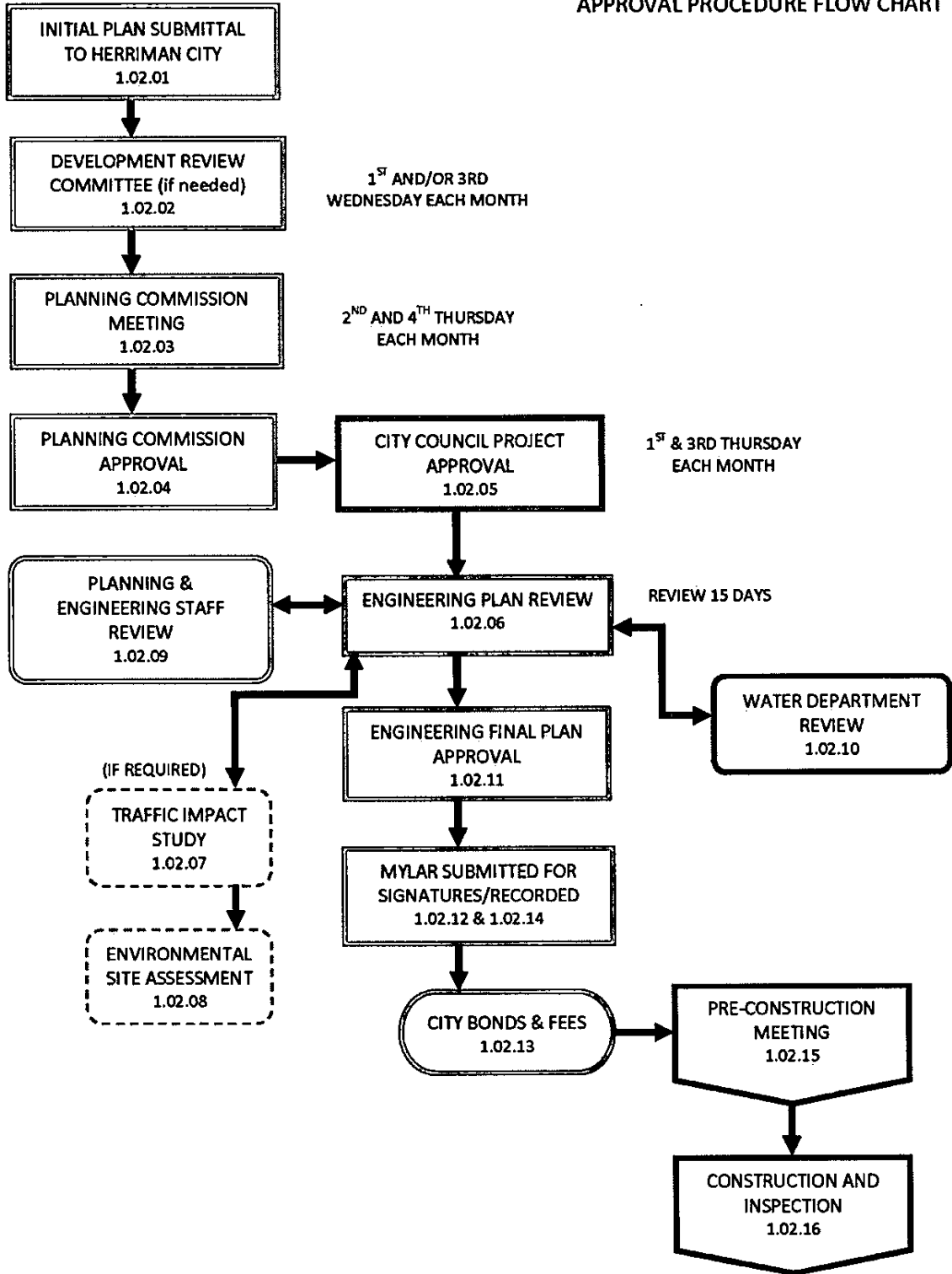
1.01 Plan Review Flow Chart

The following flow chart show the important steps involved in the plan review of the following types of Developments: Conditional Use, Simple Subdivision or Lot Split, Subdivision, Master Planned Subdivision, and Planned Unit Development. All land developments in Herriman City shall follow the appropriate procedure detailed below.

- 1.01.01 **Conditional Use.** Generally a conditional use is a land use which would not be permitted under the normal regulations of a zoning district; however the proposed use may be made acceptable within the zoning district if construction or development of the use complies with specified additional development standards or special conditions provided by the planning commission. The standards or conditions of approval are described on a conditional use permit that remains with the land, provided the standards and conditions of the permit continue to be followed.
- 1.01.02 **Subdivision and Master Planned Subdivision.** Subdivision means any land that is divided, re-subdivided or proposed to be divided into lots, parcels, sites, units, plots, or other division of land for the purpose, whether immediate or future, for offer, sale, lease, or development either on an installment plan or upon any and all other plans, terms, and conditions.
- 1.01.03 **Planned Unit Development (PUD).** The planned unit development means an integrated design for development of residential, commercial, or industrial use, or combination of such uses, in which one or more of the regulations, other than use regulations, of the district in which the development is to be situated, is waived or varied to allow flexibility and initiative in site and building design and location in accordance with an approved plan and imposed general requirements as specified in this chapter. A planned unit development may be: The development of compatible land uses arranged in such a way as to provide desirable living environments that may include private, public and common open spaces for recreation, circulation, and/or aesthetic uses; or creation of areas for multiple use that are of benefit to the neighborhood and the City.

SECTION 1: GENERAL APPROVAL PROCEDURE

APPROVAL PROCEDURE FLOW CHART



SECTION 1: GENERAL APPROVAL PROCEDURE

1.02 Approval Procedure

The steps listed herein may require multiple reviews or revisions. Multiple meetings may also be required.

- 1.02.01 **Initial Plans Received by Herriman City.** Developer to submit proposed development in initial design phase. Initial drawings shall show the proposed layout of lots, proposed street system, and proposed land uses.
- 1.02.02 **Development Review Committee.** The City Planner and Engineer will meet with the developer(s) to discuss needed improvements and answer any questions regarding Herriman City approval procedure. Meetings will be held on the first and/or third Wednesday of every month. In order to be placed on the development review committee's agenda, an application must be submitted one week prior to the upcoming scheduled meeting.
- 1.02.03 **Planning and Zoning Meeting and Requirements.** Planning Commission will discuss what is required and give all necessary conditions for the design and construction of the development. The Planning Commission will use City Staff's recommendations as a guideline for what will be required of the development.
- 1.02.04 **Preliminary and Final Planning Commission Approval.** The Planning Commission will grant preliminary approval upon acceptance of the proposed design of the development. Approval is required before proceeding to engineering review.
- 1.02.05 **City Council Project Approval.** City Council Project Approval will follow final Planning Commission approval. The City Council may grant approval during the City Council meeting.
- 1.02.06 **Engineering Plan Review.** To understand the function of the proposed development, engineering conceptual design review is required. All plans to be reviewed by Engineer must be submitted for Engineering review after Planning Commission approval. The purpose of engineering plan submittal is to ensure that the proposed development will follow all development procedures and standards adopted by Herriman City. All improvement plan submittal requirements must be submitted before plan review will begin. The plan review process will take fifteen working days from the day that all required improvement plan submittal(s) have been received. Redlines will be provided and must be addressed before proceeding to engineering final plan submittal. Plan review will remain in this stage until Herriman City completely accepts the proposed improvements within the plan set.
- 1.02.07 **Traffic Impact Study.** New land developments, expansions of existing developments, and proposed changes in developments (redevelopments) can have a significant impact on the transportation system if there is not adequate planning and consideration of necessary improvements. To ensure that Herriman City can accommodate a proposed development, a Traffic Impact Study (TIS) may be required

SECTION 1: GENERAL APPROVAL PROCEDURE

to analyze relevant impact issues. A TIS shall be required for all developments which generate 100 or more new peak hour trips or which will have a significant impact on the City's transportation system as determined by the City Engineer. For TIS guidelines see *Section 4.02*.

- 1.02.08 **Environmental Site Assessment.** Environmental studies conducted by the Bureau of Reclamation and the State of Utah, Division of Response and Remediation in 1998 and 1999 have indicated a potential for lead and arsenic contamination in soils on some agricultural and residential properties in and around Herriman, Utah. Therefore, prior to application for a building permit, every new home and subdivision to be constructed or developed in the suspected Herriman areas shall require a review of the environmental status of the property. The City shall determine if the property being developed is in the areas that have indicated a potential for lead and arsenic contamination from the environmental studies conducted in 1998 and 1999. For environmental site assessment guidelines see *Section 4.03*.
- 1.02.09 **Planning and Engineering Staff Plan Review.** The Planning Staff will review plans with Engineering Staff as required to ensure Planning Commission requirements are met and all proposed improvements follow Herriman City's general plan.
- 1.02.10 **Water Department Review.** The Water Department shall review the plans to determine culinary water and secondary water system compliance with Herriman City Standards. This review shall occur simultaneously with the Engineering Review, and shall have the same requirements.
- 1.02.11 **Engineering Final Plan Approval.** Upon completion of the engineering plan submittal the final plans shall be submitted and if all corrections have been made and the City is satisfied with the proposed improvements, final approval will be granted. With final approval, applicable bonds and fees will be calculated and the totals will be provided to the Developer. The Developer shall provide four (4) 24x36 and one (1) 11x17 plan sets and all electronic files to the City upon engineering final plan approval.
- 1.02.12 **Mylar Plat Submittal.** The plat shall have all correct information, required signatures, and follow the format described in *Section 3.04*. A title report of the property being platted shall accompany the mylar plat submittal. Utility signatures shall be obtained before delivering the plat to the City.
- 1.02.13 **City Bonds and Fees.** All bonds and fees assessed at engineering final plan approval shall be posted and paid to the City before the mylar will be signed by Herriman City. See *Section 2.05* for the types of acceptable bonds.
- 1.02.14 **City Signatures.** After all bonds and fees have been paid in full, submit plat to the Engineering Department, to collect the City Engineer, City Planning Commission, City Water, and City Attorney's signatures. All requirements shall be met before signatures will be collected. Upon approval and after all signatures have been

SECTION 1: GENERAL APPROVAL PROCEDURE

obtained, the mylar plat shall be recorded at the Salt Lake County Recorder's Office by the Developer.

- 1.02.15 **Pre-Construction Meeting.** A Pre-Construction Meeting with the Developer, Contractor, and city departments including Water, Public Works Inspection, and Engineering is required prior to start of construction. This shall be scheduled through the Engineering Department.
- 1.02.16 **Construction and Inspection.** Throughout the construction of the proposed improvements, the Contractor shall make every effort to ensure that construction is being performed in a professional manner and in strict accordance with the approved plans and Herriman City's Development Standards. A public works inspector will perform periodic inspections throughout the progress of the development to ensure that the improvements are being constructed in accordance with the Development Standards and the approved plan set. The public works inspector will notify the developer of any deficiencies in the work and may issue a letter of non-compliance if necessary. All improvements shall be constructed correctly and any deficiencies shall be fixed in a timely manner. It is the developer's responsibility to coordinate inspections with Herriman City Public Works Department. All improvements shall be constructed using the highest quality of workmanship and materials.

SECTION 2: GENERAL IMPROVEMENT REQUIREMENTS

SECTION 2: GENERAL IMPROVEMENT REQUIREMENTS

SECTION 2: GENERAL IMPROVEMENT REQUIREMENTS

This section is an outline of Herriman City development requirements. Requirements listed herein must be completed for each project/development. Compliance with these requirements must be maintained throughout the project.

2.01 Improvement Plan Submittal Requirements

This section outlines the improvement plan submittal requirements for each type of development.

2.01.01 **Conditional Use.** Generally a conditional use is a land use which would not be permitted under the normal regulations of a zoning district. However, the proposed use may be made acceptable within the zoning district if construction or development of the use complies with specified additional development standards or special conditions provided by the Planning Commission. The standards or conditions of approval are described on a conditional use permit that remains with the property, provided the standards and conditions of the permit continue to be followed. The conditional use submittal requirements are listed below.

1. Submit four complete sets of the improvement plans, including:
 - a. Title sheet. (3.02)
 - b. Utility overview sheet. (3.06)
 - c. Grading and drainage plans and profiles. (3.07)
 - d. Erosion control plans. (3.08)
 - e. Street improvement plans and profiles. (3.09)
 - f. Traffic signing, striping, and control plans. (3.10)
 - g. Street Light plans. (3.11)
 - h. Storm drain plans and profiles. (3.12)
 - i. Culinary water plans. (3.13)
 - j. Secondary water plans and profiles. (3.14)
 - k. Details and typical sections. (3.15)
 - l. Landscaping plans. (3.16)
 - m. Irrigation plans. (3.17)
 - n. Other special plans, as required.
2. Submit two sets of storm drain calculations.
3. Submit engineer's estimates of construction costs.
4. Submit all easements and agreements. (4.01)
5. Submit a geotechnical report.
6. Submit a traffic impact study, if required. (4.02)
7. Submit all other associated studies (geological, environmental site assessment or other hazard studies), if required.
8. Submit other information or documents as necessary.
9. Submit all necessary permits. (2.06)
10. Submit electronic files at the following stages for review: concept plan, final approval, as-built. (2.04)

SECTION 2: GENERAL IMPROVEMENT REQUIREMENTS

2.01.03 Subdivision and Master Planned Subdivision. Subdivision means any land that is divided, re-subdivided or proposed to be divided into two or more lots, parcels, sites, units, plots, or other division of land for the purpose, whether immediate or future, for offer, sale, lease, or development either on an installment plan or upon any and all other plans, terms, and conditions. Subdivision includes: The division or development of land whether by deed, metes and bounds description, devise and testacy, lease, map plat, or other recorded instrument; and divisions of land for all residential and non-residential uses, including land used or to be used for commercial, agricultural, and industrial. The requirements for both subdivision and master planned subdivision are listed below.

1. Submit a title report for the subdivided land.
2. Submit four complete sets of the improvement plans and dedicated plat(s), including:
 - a. Title sheet. (3.02)
 - b. Dedicated plat. (3.03)
 - c. Mylar plat. (3.04)
 - d. Utility overview sheet. (3.06)
 - e. Grading and drainage plans and profiles. (3.07)
 - f. Erosion control plans. (3.08)
 - g. Street improvement plans and profiles. (3.09)
 - h. Traffic signing, striping, and control plans. (3.10)
 - i. Street Light plans. (3.11)
 - j. Storm drain plans and profiles. (3.12)
 - k. Culinary water plans. (3.13)
 - l. Secondary water plans and profiles. (3.14)
 - m. Details and typical sections. (3.15)
 - n. Landscaping plans. (3.16)
 - o. Irrigation plans. (3.17)
 - p. Other special plans, as required.
3. Submit two sets of storm drain calculations.
4. Submit engineer's estimates of construction costs.
5. Submit survey notes.
6. Submit any escrow agreements.
7. Submit all easements and agreements. (4.01)
8. Submit a geotechnical report.
9. Submit a traffic impact study. (4.02)
10. Submit all other associated studies (geological, environmental site assessment or other hazard studies), if required.
11. Submit other information or documents as necessary.
12. Submit a master plan layout showing the development in phases.
13. Submit a transportation master plan.
14. Submit a water master plan.
15. Submit a storm drainage master plan.
16. Submit all necessary permits. (2.06)

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17. Submit electronic files at the following stages for review: concept, final approval, as-built. (2.04)

2.01.04 **Planned Unit Development (PUD).** The planned unit development is an integrated design for development of residential, commercial, or industrial use, or combination of such uses, in which one or more of the regulations, other than use regulations, of the district in which the development is to be situated, is waived or varied to allow flexibility and initiative in site and building design and location in accordance with an approved plan and imposed general requirements as specified in this chapter. A planned unit development may be: The development of compatible land uses arranged in such a way as to provide desirable living environments that may include private, public and common open spaces for recreation, circulation, and/or aesthetic uses; or creation of areas for multiple uses that are of benefit to the neighborhood and the City. The submittal requirements for a planned unit development are listed below:

1. Submit a title report for the proposed subdivided land.
2. Submit four complete sets of improvement plans and dedicated plat(s), including:
 - a. Title sheet. (3.02)
 - b. Dedicated plat. (3.03)
 - c. Mylar plat. (3.04)
 - d. Project overview map. (3.05)
 - e. Utility overview sheet. (3.06)
 - f. Grading and drainage plans and profiles. (3.07)
 - g. Erosion control plans. (3.08)
 - h. Street improvement plans and profiles. (3.09)
 - i. Traffic signing, striping, and control plans. (3.10)
 - j. Street Light plans. (3.11)
 - k. Storm drain plans and profiles. (3.12)
 - l. Culinary water plans. (3.13)
 - m. Secondary water plans and profiles. (3.14)
 - n. Details and typical sections. (3.15)
 - o. Landscaping plans. (3.16)
 - p. Irrigation plans. (3.17)
 - q. Other special plans, as required.
3. Submit two sets of storm drain calculations.
4. Submit engineer's estimates of construction costs.
5. Submit survey notes.
6. Submit any escrow agreements.
7. Submit all easements and agreements. (4.01)
8. Submit a geotechnical report.
9. Submit a traffic impact study. (4.02)
10. Submit all other associated studies (geological, environmental site assessment or other hazard studies), if required.
11. Submit other information or documents as necessary.

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12. Submit a master plan layout showing the development in phases.
13. Submit a transportation master plan.
14. Submit a water master plan.
15. Submit a storm drainage master plan.
16. Submit all necessary permits. (2.06)
17. Submit electronic files at the following stages for review: concept, final approval, as-built. (2.04)

2.02 Contractor/Developer

For the purpose of this document, the developer and the contractor are considered one and the same.

2.03 Engineer's Seal Required

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

2.04 Electronic File Requirements

Concept, final approved and as-built surveys in electronic format shall be submitted and accepted by the Herriman City Engineering Department. The electronic drawings shall be in Computer Aided Drafting (CAD) file format. The acceptable formats are AutoCAD 2002 or later. The deliverables for CAD submittals are AutoCAD drawing files and Microsoft Excel files. All CAD files shall be registered to the North American Datum 83 (NAD83) State Plane Coordinates US Survey foot, Utah Central Zone coordinate system (grid) with ties to two public monuments. Information on monuments is available through Herriman City or Salt Lake County Surveyor.

2.04.01 **File Content and Layering.** To ensure that all electronic files will be able to be incorporated into Herriman City's Geographic Information System correctly, all electronic files submitted shall be drawn and labeled on individual layers. These layers shall include:

1. Water line sizes on individual layers.
2. Water service layer.
3. Water meter layer.
4. Water valve layer.
5. Fire hydrant layer.
6. Hydrant service layer.
7. Hydrant valve layer.
8. Storm drain line sizes on individual layer.

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9. Storm drain manhole layer.
10. Storm drain catch basin layer.
11. Detention pond layer.
12. Sewer line layer.
13. Sewer manhole layer.
14. EOP (edge of pavement) layer.
15. Lot layer.
16. Lot number layer.
17. Sidewalk layer.
18. Back of curb layer.
19. Road centerline layer.
20. Dimension layer.
21. Contour layer.
22. Sprinkler head layer.
23. Sprinkler line sizes on individual layers.
24. Sprinkler valves layer.
25. Sprinkler timers layer.
26. Street light wire sizes on individual layer.
27. Street light location.
28. Street Light Junction boxes.

2.04.02 Geometry. All files shall be constructed in a format that is geometrically correct; meaning that all lines that intersect are snapped together at a common point (no overlapping lines or short shots). Street centerlines shall be segmented to be a continuous polyline. Structures (bridges, box culverts, and arch culverts) shall be surveyed at the four corners of the structure and shall be drawn to form an enclosed polygon for each structure. Bridges shall be surveyed at the top of the bridge abutments on the four corners. Storm drain and sanitary sewer pipes shall be drawn in the direction of flow and shall be a continuous polyline from structure to structure and snapped together at the centerline of the structure. Water lines shall be segmented to be a continuous polyline from pipe intersection or at changes in pipe size. Water line shall be drawn without curves. A series of lines shall be used to represent smooth curves. The edge of pavement, curb and gutter, sidewalks, street centerlines, culinary waterlines, and storm drain lines shall be 3D polylines representing their actual horizontal and vertical location. Where text is being placed for a polygon feature, the text justification point shall be placed within the boundary of the polygon. It is acceptable to have the text overwrite one another.

2.05 Bonding Information

A bond posted with Herriman assures the City that required improvements will be completed according to City specifications. City Ordinance allows for the following bond choices:

2.05.01 Escrow. A special account with a local bank in which the bank agrees to hold the funds until the City directs them to release it.

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upland environment. Also included are any stream systems that exist within the boundaries of a municipality, or stream systems located on United States Government, Utah State Government, or Native American Tribal lands. To obtain a permit, contact the Utah Division of Water Rights. The Stream Alteration Permit may indicate that a 404 Permit from the Army Corps of Engineers may be required.

- 2.06.03 **UPDES Permit.** Construction activities that disturb 1 acre or more require a UPDES permit. The UPDES program requires permits for the discharge of pollutants from any source into waters of the State. Contact the State Division of Water Quality's web site for additional information.
- 2.06.04 **Utah State Dam Safety Permit.** A dam is classified as anything that impounds water. Any dam that holds less than 20 acre feet requires a permit only, while any dam that holds greater than 20 acre feet requires engineering drawings as well as a permit, which may be obtained from the Utah Division of Water Resources, Dam Safety.
- 2.06.05 **Road Cut Permit.** A road cut permit, also classified sometimes as an excavation permit, is required whenever construction activities are to be performed in city rights-of way. A permit may be obtained by contacting Herriman City.
- 2.06.06 **FEMA Application.** Subdivision or building permit applications that propose developing property within a FEMA Zone A flood area (100 year flood plain) are required to prepare and submit a Letter of Map Amendment (LOMA) and/or Letter of Map Revision (LOMR-F). These are required before final plat and/or building permits.
- 2.06.07 **UDOT Road Permits.** All projects that are adjacent to a UDOT road that include access onto a state road require an access permit from the Utah Department of Transportation.
- 2.06.08 **Miscellaneous Permits.** Other permits may also be required before final approval, including access over the Kern River Natural Gas Pipeline, irrigation canals, access to public lands, etc.
- 2.07 **Pre-Construction Conference**
- 2.07.01 After final approval, the Contractor may be released for construction of the development. A pre-construction conference shall be held before any excavation or other work is begun in the development. The meeting will be held at Herriman City, and will include:
1. City Engineer or his representative (inspector or engineer).
 2. Municipal Water representative.
 3. Parks Department representative.
 4. Developer.

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5. Developer's design engineer.
6. All contractors and subcontractors involved with installing the development improvements.
7. Representatives of the affected utility companies.
8. Others as may be necessary.

2.07.02 A pre-construction conference application shall be submitted by the developer and can be found on the City's website. This application will schedule the meeting and notify all Herriman City Personnel of the upcoming pre-construction conference. The meeting will be conducted by the City Engineer or his representative. Items to be discussed shall relate to project scheduling, materials used, coordination with all affected parties, and other important items as may be deemed necessary by the City Engineer. Minutes will be taken and distributed to all in attendance. The Contractor will not be permitted to proceed with construction unless this meeting takes place and those responsible for all construction activities are in attendance.

2.08 Inspection

All construction work involving the installation or repair of improvements in developments shall be subject to inspection by the City. It shall be the responsibility of the developer to ensure that inspections take place where and when required as indicated in the specifications, on the permit and as discussed in the preconstruction conference, where applicable. All projects will be assigned an inspector in which the inspector will be responsible for the project and all information shall be directed through the inspector in charge of the project. It is Herriman City's objective to be proactive with the inspection of each project and in order to facilitate this objective it is the developer's responsibility that all inspections shall be completed.

2.08.01 **Continuous and Periodic Inspection.** Certain types of construction may require continuous inspection, while others will only require periodic inspections. The type and amount of inspection performed by the City shall be at the sole discretion of the City Engineer. On construction requiring continuous or periodic inspection, no work shall start until an inspection request has been made to the City by the Developer and the required submittals received and approved by the City. Throughout the inspection process the contractor shall ensure that the infrastructure installed in the project is inspected and surveyed. The City may require the contractor to leave some infrastructure open to review and inspect. Continuous inspection may be required on the following types of work:

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

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- 2.08.02 System Improvements.** All projects have multiple systems in order to better manage the flow of each project the City shall calculate the bond according to the system it is related to. The inspection process shall follow the systems also to define stages of each project. The six systems that Herriman City shall evaluate with each project are listed below:
1. **Storm Drain System Improvements.** All pipe, manholes, catch basins, inlet structures, outlet structures, swales, pond excavation, and other structures required in the project that convey storm water.
 2. **Culinary Water System Improvements.** All pipe, fittings, valves, services, hydrants, blow off assemblies, air vacuum release valves, sampling stations, pressure reducing valves, and other structures required in the project that convey drinking water.
 3. **Secondary Water System Improvements.** All pipe, fittings, valves, services, blow off assemblies, air vacuum release valves, pressure reducing valves, and other structures required in the project that convey secondary water.
 4. **Street System Improvements.** All earth work, grading, road base, curb and gutter, waterways, asphalt, sidewalk, sidewalk ramps and other structures required in the project that convey vehicular or pedestrian traffic.
 5. **Irrigation and Landscaping System Improvements.** All water pipe, valves, controllers, landscaping, trees, shrubs, park equipment, fencing, and other equipment required in the project.
 6. **Miscellaneous System Improvement.** All street monuments, collars, erosion control devices, street lights and any other structures or equipment required in the project.
- 2.08.03 System Material Inspection.** As each project begins each phase of construction and the material is on the project, the contractor shall request a system material inspection. This inspection shall ensure all proper materials for each system is verified prior to install.
- 2.08.04 System Start Up Inspection.** As each project begins each phase of construction, the contractor shall request an inspection. This inspection is crucial to ensure proper installation is observed before system wide construction is allowed to reduce possible defects or deviancies.
- 2.08.05 System Partial Release Inspection.** During the construction of each system, the developer may request one partial release from the above six system improvements. This inspection shall occur at any time, but is only allowed one time per system. No other partial releases will be granted until system substantial completion has been reached. This inspection only requires one inspector. The system partial release inspection does not in any way guarantee or warrant any work installed but is only a quantity measure that construction has installed the portion of the improvements being requested for system partial bond release. See *Section 2.09* for bond release information.

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- 2.08.06 System Substantial Completion Inspection.** As each system is completed an inspection shall occur that reviews the entire system and ensures that the system is installed and functional according to all Herriman City standards. This inspection requires two Herriman City representatives and shall be completed by the project inspector and a representative for the system. See *Section 2.10* for bond release information.
1. Storm Drain System Improvements substantial completion shall be completed after curb and gutter installation and base placement, but before asphalt installation.
 2. Culinary Water System Improvements substantial completion shall be completed after curb and gutter installation and base placement, but before asphalt installation.
 3. Secondary Water System Improvements substantial completion shall be completed after curb and gutter installation and base placement, but before asphalt installation.
 4. Street System Improvement substantial completion shall be completed after all the improvements bonded for are in and the system is functioning according to Herriman City standard. Street bonds may be withheld if the "dry" utilities have not been installed to insure that new roadways are not required to be cut.
 5. Irrigation and Landscaping System Improvement substantial completion shall be completed after all the improvements bonded for are in and the system is functioning according to Herriman City standard.
 6. Miscellaneous System Improvement substantial completion shall be completed after all the improvements bonded for are in and the system is functioning according to Herriman City standard. Street lights shall also be included under the Miscellaneous System Improvements.
 7. Submit electronic as-builts per *Section 2.10*. Submittal must be examined and approved by the IT Department to ensure compliance with the standards.
 8. Fire flow test shall be performed as required by the UFA Fire Department. Copies of the test shall be submitted to the UFA Fire Department and the City.
- 2.08.07 Final Completion.** Final Completion shall occur after all systems have been completed and inspected, electronic as-builts are submitted and accepted, and the fire flow test is completed. The last system to be completed and approved shall cause Final Completion to be granted. Final Completion is not an inspection; however it begins the warranty period for all systems. See *Section 2.11* for bond release information.
- 2.08.08 End of Warranty Inspection (12 Month Inspection).** End of Warranty Inspection shall occur twelve months from the Final Completion. This inspection is an audit to ensure system construction is still free of defects and deficiencies. This inspection shall require two Herriman City representatives and shall be completed by the project inspector and a representative for the system. See *Section 2.12* for bond release information.

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1. Requests for inspection on work requiring continuous inspection shall be made at least two (2) working days prior to the commencing of the work. Notice shall also be given 24 hours in advance of the starting of work requiring periodic inspection, unless specific written approval is given otherwise. For inspection requiring two or more Herriman City representatives notice shall be given one (1) week and will only be scheduled on a Tuesday or Thursday. It is critical that all inspection requests are complete and ready for inspection. Work done by the Contractor which requires periodic or continuous inspection beyond the normal working hours of the City (8 am to 5 pm Monday thru Friday), on weekends or City holidays shall require prior payment of current City overtime rates by the contractor.

2.09 Partial Bond Release

During the construction of each system the developer may request one partial bond release per system. This inspection shall occur at any time, but is only allowed one time per system. As outlined in *Section 2.08.05 System Partial Release Inspection*, once partial release has occurred for each system no releases will be granted until System Substantial Completion Bond Release. The system partial release inspection does not in any way guarantee or warrant any work installed but is only a quantity measure that contractor has installed the portion of the improvements being requested for partial bond release. Partial releases are not required but may be granted once per system.

2.10 System Substantial Completion Bond Release

System Substantial completion inspection shall be made by the City Engineer or a representative after ALL system construction work is completed. Upon substantial construction completion, contractor shall submit a substantial completion inspection application to the City prior to the improvement inspection. These inspections shall be completed as discussed in *Section 2.08.06*. Any faulty or defective work shall be corrected by the persons responsible for the work within a period of fifteen (15) days from the date of the inspection report defining the faulty or defective work. Should the Contractor fail to complete the required work, the City Engineer, at his discretion, may complete the defective work and bill the Contractor, using the monies in escrow, or otherwise held by the City to complete the defective work. If the City Engineer or a representative determines damages or defective is present and is concerned that replacement may cause more damage than desired, the City Engineer or a representative may elect to take monies from the bond for the cost of replacement of damaged and defective work rather than removing the defective work. In addition, the City may withhold future permits from the affected Contractor, Subcontractor or Developer. After this inspection occurs and ALL system improvements constructed are approved, an As-built record of plans shall be made. These As-built plans shall show location of all infrastructures installed for all culinary water, storm drain, secondary water, street system, irrigation and landscaping, street lights and any other system improvements installed by the developer and shall be submitted electronically and reviewed prior to release. See *Section 2.04* for the electronic file format. All plans shall be surveyed and stamped by a Professional Engineer licensed in the State of Utah. In addition, the developer will

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be required to provide final survey on all detention facilities to ensure design capacity is achieved. All surveys shall be stamped and certified by a licensed land surveyor. This As-built shall be drawn in accordance with Herriman City file format and must be completed and approved before any release of bond will occur. In addition, the UFA Fire Department requires a fire flow test before granting their approval. Upon receipt of the above stipulated conditions a release of the bond may be granted in the amount of 75% of the bond for that system.

2.11 Final Completion

Final Completion shall occur after all systems have been completed and inspected, electronic as-builts are submitted and accepted, and the fire flow test is completed. See *Section 2.08.07* for inspection information regarding Final Completion. The last system to be completed and approved shall cause Final Completion to be granted. Final Completion begins the warranty period for all systems. Upon final completion all systems shall have been released to 75% of the bond amount. Final Completion begins the warranty period.

2.12 Guarantee of Work

The developer shall warrant and guarantee (a retainage of an escrow or other security in the amount as dictated by applicable City ordinances) that the improvements and every part thereof will remain in good and serviceable condition for a period of twelve months from the final date of all substantial completion inspections report by the City Engineer or his authorized representative. Additionally, the developer shall ensure that the improvements are in good condition during that warranty period at no cost to the City. Any repairs required by the City shall be made at no cost to the City. It is further agreed and understood that the determination for necessity of repairs and maintenance of the work rest with the City Engineer. The Engineer's decision upon the matter shall be final and binding upon the Developer, and the guarantee hereby stipulated shall extend to and include, but shall not be limited to, the entire street base, and all pipes, fittings, joints, valves, backfill, and compaction, as well as the working surface, curbs, gutters, sidewalks, and other accessories that are or may be affected by the construction operations. Also, whenever, in the judgment of the City Engineer, said work shall be in need of repairs, maintenance, or rebuilding, the Engineer shall cause a written notice to be served upon the Developer or permittee, or both, and the responsible party(s) shall undertake and complete such repairs, maintenance, or rebuilding. If the responsible party(s) fails to do so within thirty (30) days from the date of the service of such notice, the City Engineer shall have such repairs made. The cost of such repairs shall be paid by the responsible party(s), together with 25 percent in addition thereto as damages for failure on the part of the responsible party(s) to make the repairs. If the City Engineer or a representative determines the presence of damaged or defective work and is concerned that replacement may cause more damage than desired, the City may elect to take monies from the bond for the cost of replacement of damaged and defective work rather than removing the defective work. Additionally the City Engineer may withhold future permits from the affected contractor, subcontractor or developer for failure to comply with City requirements. An End of Warranty Inspection as outlined in *Section 2.08.08* shall occur prior to the completion of the warranty period to verify compliance with the above stipulated conditions. After this inspection occurs ALL constructed improvements shall be accepted by Herriman City, and the remaining twenty-five percent (25%) of the bond shall be released.

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2.13 Development Safety

It shall be the responsibility of the developer to maintain and enforce all Federal, State, and Local safety codes involved with the development. All excavations shall be conducted in a manner resulting in a minimum amount of interference or interruption of street or pedestrian traffic. Inconvenience to residents and businesses fronting on the Public Way shall be minimized. Suitable, adequate and sufficient barricades and/or other structures will be available and used where necessary to prevent accidents involving property or person. Barricades must be in place until all of the permittee's equipment is removed from the site and the excavation has been backfilled and proper temporary gravel surface is in place, except where backfilling and resurfacing is to be done by the City. In this case, the barricades together with any necessary lights, flares, or torches, must remain in place until the backfill work is commenced by the City. From sunset to sunrise, all barricades and excavations must be clearly identified by adequate signal lights, torches, etc. Street closure and traffic detours require permission from the City Engineer based on a traffic control/detour plan submitted by the contractor. The Police Department and Fire Department shall be notified at least 24 hours in advance of any planned excavation requiring street closure or traffic detour by the permittee.

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Improvement plans submitted to Herriman City for review and approval shall follow the formatting requirements set forth in this *Section 3*. The following formatting procedure helps ensure proper plan review and maintenance of consistent standards by Herriman City.

3.01 General

All improvement plans submitted for review and approval by Herriman City shall be designed in accordance with current Engineering practices. All plan sets shall meet the requirements listed below.

- 3.01.01 A location map shall be included with the plans.
- 3.01.02 An index sheet shall be included with the plans.
- 3.01.03 All drawings shall be drawn on, 24" x 36" paper with a maximum scale of 1" = 100' on plans and 1" = 10' on profile sheets.
- 3.01.04 Show a North arrow on all pages of the plan set.
- 3.01.05 Show the scale on all pages of the plan set and on each detail.
- 3.01.06 Show a title block on the lower right hand corner of all pages within the plan set.
- 3.01.07 Completely dimension and describe all proposed improvements.
- 3.01.08 All plans shall be stamped, signed, and dated by a Registered Engineer, Architect, Landscape Architect, or Surveyor.
- 3.01.09 Elevations shall be referenced to the North America Datum 83, (NAD 83), State Plane Coordinates, Utah Central Zone. No assumed elevations will be acceptable.
- 3.01.10 Show stationing and elevations for all profiles.
- 3.01.11 Provide general and construction notes throughout the plan set. This shall include any mitigation for contaminated soils.
- 3.01.12 Show details for all proposed structures.
- 3.01.13 Plan sets shall include an emergency contact phone number and name of the developer's responsible person who will be available 24 hours a day, should an emergency situation arise.

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3.02 Title Sheet

A title sheet is required for all plans submitted to Herriman City. The title sheet shall be arranged in a visually appealing manner. The title sheet is required to include the following items listed below.

- 3.02.01 Show the name of City on the title sheet.
- 3.02.02 Show the project title of the proposed development.
- 3.02.03 Specify the type and location of work to be constructed within the development.
- 3.02.04 Show the name, address, phone, etc. of the engineer or firm preparing drawings.

3.03 Dedicated Plat

The following instructions are for the purpose of standardizing the preparation of plat drawings to obtain uniformity in appearance, clarity, size, and style.

- 3.03.01 **Subdivision Plat.** The following information shall be included on all final subdivision plats.
 - 1. All subdivision plats shall be drawn on 24"x 36" paper with a maximum scale of 1"= 100'.
 - 2. The North arrow, scale of the drawing, the date of preparation and any revisions dates shall be shown on the plat.
 - 3. Provide accurately drawn boundaries showing the bearings and dimensions on all boundary lines of the subdivision or project. These lines shall be slightly heavier than the street and lot lines. The boundary survey shall be of second order accuracy. A traverse of the exterior boundaries of the tract, and of each block, when computed from field measurements on the ground shall close within a tolerance of one foot to 10,000 feet of perimeter. Elevations shall be referenced to nearest Salt Lake County benchmark.
 - 4. Show the adjoining corners of all adjoining subdivisions shall be identified by lot and block numbers, subdivision name and place of record or other proper designation.
 - 5. Show the names, widths, lengths, bearings and curve data on centerlines of the proposed streets, alleys and easements; including bearing and distance of straight lines, and central angle, radius and arc length of the curves; and such information as may be necessary to determine the location of the beginning and ending points of curves.
 - 6. All proposed streets shall be named or numbered in accordance with, and conform to the adopted street naming and number system of Herriman City and Salt Lake County. Individual lots shall include a street address, which conforms to the number system of Herriman City and Salt Lake County.
 - 7. The final plat shall show all survey, mathematical information and data necessary to locate all monuments and to locate and retrace all interior and

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exterior boundary lines appearing thereon, including bearing and distance of straight lines, central angles, radius and arc length of curves, and such information as may be necessary to determine the location of the beginning and ending points of curves.

8. All lots, blocks, and all parcels offered for dedication or any purpose shall be delineated and designated with dimensions, boundaries and courses clearly shown and defined in every case. Parcels offered for dedication, other than for streets or easements, shall be designated by letter. Sufficient linear, angular and curve data shall be shown to determine readily the bearing and length of the boundary lines of every block, lot and parcel which is a part thereof. In general, all remnants of lots below minimum size must be added to adjacent lots, rather than allowed to remain as unusable parcels.
9. Provide a dedication description of all lots that will be conveyed by plat to Herriman City.
10. The plat shall show fully and clearly all stakes, monuments and other evidence indicating subdivision boundaries, street intersections, individual lot corners and any other monument used in establishment of lines, grades and curves of the plat.
11. Sheets shall be so arranged that no lot be split between two or more sheets. No ditto marks shall be used for dimensions.
12. The plat shall show the right-of-way lines of each street, the width of any portion being dedicated, and widths of any existing dedications. The widths and locations of adjacent streets and other public properties within 50-feet of the subdivision shall be shown with dotted lines. If any street in the subdivision is a continuation or an approximate continuation of an existing street, the conformity or the amount of nonconformity of such street to such existing streets shall be accurately shown.
13. Fine dashed lines shall show the sidelines of all easements. The widths of all easements and sufficient ties thereto, to definitely locate the same with respect to the subdivision shall be shown. All easements shall be clearly labeled and identified. All lots shall have easements as required by the Subdivision Ordinance.
14. Plat shall include a statement that each and every owner of any interest in a private roadway shall be jointly and severally responsible for the maintenance and repairs to the roadway. The City shall have no responsibility or liability for the maintenance of or repair to any private roadway.
15. Provide any other requirements required by the County Recorder.
16. Show Street light locations with appropriate light spacing.
17. Show fire hydrant locations with appropriate spacing.
18. Show the location of any 100 year flood plain as designated by the Federal Emergency Management Agency (FEMA).
19. Show all 30% slope clearly labeled as non-buildable area.
20. Show any land use restrictions due to impacted soils.

3.03.02 **Title Block.** The first sheet of the plat, below the title, shall show the name of the licensed land surveyor, together with the date of the survey, the scale of the map and

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the number of the sheets. The following certificates, acknowledgements and descriptions shall appear on the first sheet of the final plat, and may be combined, where appropriate.

1. The dedicated plat shall have the same format with all appropriate signature blocks as the Herriman City standard title block (*Standard Plans*). Electronic File Format will be made available upon request.
2. A description of all property being subdivided with reference to maps or deeds of the property shall have been previously recorded or filed. Each reference in such description shall show a complete reference to the book and page of records of the County.
3. Certification of survey by a licensed land surveyor.
4. Owner hereby agrees to “warrant and defend and save the City harmless against any easements or other encumbrance on a dedicated street which will interfere with the City’s use, maintenance and operation of the street”.
5. Notary Public’s acknowledgement.
6. City Planning Commission’s certificate of approval.
7. Health Department’s certificate of approval.
8. Community Development Director’s certificate of approval.
9. City Council’s certificate of approval.
10. City Attorney’s certificate of approval.
11. Herriman City Water’s certificate of approval.
12. City Engineers certificate of approval.
13. Owner’s or operators of the underground and utility facilities certificate of approval.
14. A one-and-one-half by five-inch space in the lower right hand corner of the plat for the County Recorder’s use.

3.03.03 Addressing. The Developers and Engineer/Surveyor will provide addressing on the plat according to the City’s Master Address Grid. The requirements for addressing in Herriman City are listed below.

1. All streets running North to South or East to West shall be assigned a numeric coordinate (i.e. 2100 South).
2. Streets that curve shall be assigned names. Street signs shall include the appropriate coordinates.
3. Streets that backtrack, loop or are longer than 600 feet and curve more than 30 degrees from original heading shall be assigned at least two separate names.
4. Shallow street circles or street bubbles shall be addressed as part of the main street if there is not one lot on both sides of the circle before the radius point, otherwise all circles shall have a separate name.
5. Names of streets will not be allowed to continue in more than one bearing (either due North to South or due East to West, but not both).
6. All street names will be verified and approved by the County before assigned in order to avoid duplication. An approval letter from the County is required for street name authorization.

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7. All addresses will be accepted by the City with respect to the front of the building. This means that corner lots will have two addresses until the building permit is issued at which time one of these addresses will become the permanent address.
8. In order to avoid confusion, addresses of homes on parallel or adjacent streets shall not coincide.
9. Proposed street names that sound very similar to existing names or street names that have unconventional spellings shall be avoided.
10. Proposed street names are encouraged to have the following characteristics:
 - a. Historic significance.
 - b. Local color and sense of place.
 - c. Overall theme.
 - d. Compatibility with adjacent streets.
11. Proposed street names shall not be longer than 17 letters and spaces so they may be legible on a standard City street sign.
12. To minimize confusion, the following type of proposed streets shall be named:
 - a. Streets that change direction.
 - b. Loop or horseshoe streets.
 - c. Streets that have intersection coordinate changes.
 - d. Cul-de-sacs.
 - e. Dead-end streets that will likely be extended into one of the above street types.
13. Proposed street names and street types should be matched as follows:
 - a. Boulevard, Parkway – arterial.
 - b. Drive, Road – streets longer than 1,000 feet.
 - c. Way – curvilinear streets longer than 1,000 feet.
 - d. Street, Avenues – straight directional streets.
 - e. Lanes – short secondary connecting streets.
 - f. Circle, Court, Place, Cove – cul-de-sacs and dead-end streets.
14. No home or building address shall end in a number zero or five.
15. All numeric coordinates are required at all road intersection and dead-ends (cul-de-sacs)

3.04 Mylar Plat

All plats shall be clear and legible and conform to accepted engineering and drafting practice discussed in *Section 3.03*. All subdivision plats to be recorded shall be plotted on mylar sheets (4 mil). Size of plat sheets shall be 24" x 36" with 1 ½ inch border on the left side and ½ inch on all other sides. Additionally, an electronic submission shall be required as well as the plotted mylar. This electronic file shall conform to the electronic format discussed in *Section 2.04*.

3.05 Project Overview Map

The purpose of the project overview map is to show the entire project as each phase is submitted for a planned unit development. The project overview map is required to show how each phase will complete the overall theme of the planned unit development and to ensure that all

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improvements will tie in with each future phase of the development. The project overview map shall show:

- 3.05.01 A north arrow and scale.
- 3.05.02 Any existing street within 200 feet of the development.
- 3.05.03 Street Improvements.
- 3.05.04 All street names.
- 3.05.05 All lots.
- 3.05.06 All lot numbers.
- 3.05.07 A title Block.
- 3.05.08 Each phase number and boundaries.
- 3.05.09 All detention ponds.
- 3.05.10 Any other pertinent information.
- 3.05.11 The zoning on and surrounding the project.
- 3.05.12 All building setbacks.
- 3.05.13 The public utility and drainage easements throughout the project.

3.06 Utility Overview Sheet

This subsection outlines the required items and minimum standards for the utility overview sheet.

- 3.06.01 All existing and proposed public improvements must be shown on the final drawings. Show public improvements such as storm drains, water, sewer, gas, electric or other major improvements existing or planned for construction on or near the project.
- 3.06.02 All utility service lines for electrical power, streetlights, cable television, natural gas and telephone service shall be placed underground within public utility easements dedicated on the final plat or as secured by recorded easements throughout a subdivided area.
- 3.06.03 All utility lines shall be parallel to, but not less than 12-inches from, the property lines.

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3.07 Grading and Drainage Plans and Profiles

This subsection outlines the required items and minimum standards for the grading and drainage plan.

- 3.07.01 All plan and profiles shall be drawn on 24" x 36" paper, with a maximum scale of 1" = 100' on plans, 1"=10' on profiles.
- 3.07.02 The plans shall show general site layout and drainage patterns.
- 3.07.03 Existing contours shall be shown at two foot intervals. The line type of the existing contours shall be clearly legible but lighter than all proposed improvements.
- 3.07.04 All details shall be drawn to scale to adequately provide the information necessary for contractor to clearly understand and properly construct.
- 3.07.05 Show all existing utilities within and adjacent to area proposed for grading. Include actual existing elevations obtained from field survey/pothole where potential conflicts, cover, or clearance requirements exists.
- 3.07.06 Show detention facility details as well as inlets, outlets and piping facilities.
- 3.07.07 Provide calculations to substantiate design (include in submittal but not to be included on plans).
- 3.07.08 Show all general, grading, and construction notes.
- 3.07.09 Provide grading topography at two foot minimum intervals.
- 3.07.10 Show any existing wetlands.
- 3.07.11 Provide an erosion control plan.
- 3.07.12 Show the location of existing watercourses, canals, ditches, springs and culverts.
- 3.07.13 Show the location of the 100 year flood plain as designated by the Federal Emergency Management Agency (FEMA).
- 3.07.14 The developer shall investigate the existing and proposed use of any irrigation ditch or canal within the project limits to determine if they are to be perpetuated. If the irrigation system is to be continued, the developer is responsible to contact the water right holders or Canal Company to obtain their requirements for protection of the irrigation system. In the event that an irrigation ditch or canal is to be piped or covered, the size, type, slope spacing of cleanout structures, etc. will be specified on the Drainage Plan and shall be in accordance with Herriman City Standards and

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sound engineering practice. The water right holders, their legal representative, or the Irrigation Company shall approve all related construction.

- 3.07.15 The discharge of storm water into irrigation ditches shall not be allowed without special approval from the City and the Irrigation or Canal Company. If an irrigation ditch is to be used as a storm water receptor, a written agreement must be secured from the Irrigation Company that the company will accept responsibility for receiving the water. If the City and the Irrigation Company approve, a hydraulic investigation shall be required to demonstrate the ditch or canal's capacity to accept the storm drainage.
- 3.07.16 Public water shall not be discharged onto or through private property without the appropriate easement. An easement with the right of access conveyed to Herriman City shall be provided whenever public storm drains are constructed in lands of private ownership. A minimum easement width of 20 feet centered on the storm drain pipe is required. Widths in excess of the minimum may be required by the City.
- 3.07.17 In the event that proposed construction shall direct surface or storm water runoff to properties or facilities owned and maintained by agencies other than the City, written proof of permission or approval from these agents must be provided prior to acceptance of drainage concepts and subsequent issuance of City drainage approval.
- 3.07.18 It is City policy and the developer's responsibility wherever possible to restore, protect and maintain the chemical, physical, and biological integrity of City and State waters and to restore their beneficial uses. To do so, drainage design shall address the treatment of surface and storm water runoff, both wet-weather and dry-weather discharges.
- 3.07.19 Prepare environmental mitigation plan for review on projects where the soils are contaminated.

3.08 Erosion Control Plans

To ensure that construction activities of the proposed development will not disturb other areas within the City an erosion control plan is required. The erosion control plan shall follow the requirements listed below.

- 3.08.01 The plans shall be drawn on 24" x 36" paper, with a maximum scale of 1" = 100'.
- 3.08.02 Plans shall show site general layout and drainage patterns and outlets for water exiting construction site.
- 3.08.03 Provide details at 1"=10' or other appropriate scale to adequately provide required information. These may include check dams, berms, desilting fences, sand bag and/or hay bale details and others as may be applicable.

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- 3.08.04 Show de-silting basin details as well as inlets, outlets and piping facilities.
- 3.08.05 Provide calculations to substantiate design (include in submittal but not to be included on plans).
- 3.08.06 Show all erosion control construction notes.

3.09 Street Improvement Plans and Profiles

Street improvement plans and profiles are required on all roadways within a development. To expedite the review process all street improvement plans and profiles shall meet the requirements list below.

- 3.09.01 All plans and profiles shall be drawn on 24" x 36" maximum scale of 1" = 100' on plans 1"=10' on profiles.
- 3.09.02 Plan and profiles shall be shown for top back of curbs and centerlines of all roadways.
- 3.09.03 All existing elevations shall be shown in parentheses, i.e.; (ex. elevation).
- 3.09.04 All existing utilities within and adjacent to area proposed for construction must include actual existing elevations obtained from field survey/pot hole at potential problem areas.
- 3.09.05 Provide all stationing, top back of curb elevations, centerline elevations, and curve data necessary to construct the proposed roadways within the development.
- 3.09.06 Show flow direction and type of cross drainage structures at intersections, with adequate flow line elevations.
- 3.09.07 Show typical cross section for all streets according to Herriman City Standards.
- 3.09.08 All details shall be drawn to scale.
- 3.09.09 Provide 100' minimum of existing plan and profile design when connecting to existing improvements.
- 3.09.10 Provide 300' minimum of future plan and profile design when roadway is to be extended (must also include 300' of existing profile along future right-of-way lines).
- 3.09.11 Show all benchmark locations and elevations (use State Plane Coordinates, Utah Central Zone, NAD 83).
- 3.09.12 Show general and construction notes.
- 3.09.13 Show soil boring log along centerline.

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- 3.09.14 All plans of public and private roads will be reviewed by the City Fire Marshall to verify widths will meet Fire apparatus access with proper turn-arounds. (See *Standard Plan RD-07*).
- 3.09.15 Vertical curves and information necessary for the calculation of vertical curves shall be shown on the road profile.
- 3.09.16 Utility relocations shall be shown in the road profile.
- 3.09.17 Show all fencing alignments throughout the development.
- 3.09.18 Tie-ins to existing roads shall be shown in the road profile.

3.10 Traffic Signing, Striping, and Control Plans

This subsection outlines the requirements for all traffic signing, striping and control plans.

- 3.10.01 All traffic signing, striping and traffic control plans shall be submitted to City Engineer for review and approval prior to field installation.
- 3.10.02 Follow the requirements given in *A Policy on Geometric Design of Highways and streets, 2004* or current from the American Association of State Highway and Transportation Officials (AASHTO).
- 3.10.03 Follow requirements given by Utah Department of Transportation on standard drawings for road and bridge design.
- 3.10.04 All traffic signing, striping and traffic control plans shall be designed and installed according to the current Manual on Uniform Traffic Control Devices. (MUTCD)
- 3.10.05 Traffic signing, striping, and control plans shall consider the following issues, at a minimum:
 - 1. Recommendations made in the traffic impact study.
 - 2. The functional classification of the specific roadway(s).
 - 3. Existing and proposed conditions relative to traffic volumes, lane widths and configurations, storage and taper lengths, grades, streets, and driveways.
 - 4. The speed limit(s), desired by Herriman City, of proposed roadways.
 - 5. The posted speed limit(s) of nearby existing road(s) that will allow access to the future development.
 - 6. Construction phasing.
 - 7. Sight distance.
 - 8. Location, size, and placement that maximizes safety and operation.
 - 9. The Herriman City Transportation Master Plan map and Standard Plan No. RD-01.

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10. Bicycle and pedestrian mobility and safety.
11. ADA compliance.
12. Signal timing (if applicable).
13. Transitions to existing features.
14. Impacts to neighboring developments and the environment.

3.10.06 Submitted signing and striping plan shall be submitted for City review and approval. All plans submitted must follow proper standards according to the MUTCD and address at a minimum the following:

1. Intersection (striping)
 - a. Cross Walks
 - b. Stop Bars
 - c. Turning Lanes and Turn Arrows
 - d. Traffic Lanes
2. Roadway (striping)
 - a. Roadway Lanes
 - b. Shoulders
 - c. Tapers
3. Signs
 - a. All regulatory and warning signs to be shown on submitted plans according to current MUTCD requirements.

3.11 Street Light Plans

All street light plans shall meet the requirements listed below. Other requirements may be required to ensure proper design of the street light system within the development.

- 3.11.01 Show the location and gauge of wire, conduit, fuse boxes, splice boxes, meter enclosure, power source, etc.
- 3.11.02 Show the type of wire used.
- 3.11.03 Provide details at 1"=10' or other appropriate scale to adequately provide required information.
- 3.11.04 Show all benchmark locations and elevations (use State Plane Coordinates, Utah Central Zone, NAD 83).
- 3.11.05 Show all existing utilities within and adjacent to the area proposed for construction. This must include actual existing elevations obtained from field survey. Pot holing at locations of potential conflicts, overlaps, or gaps shall be completed in the field survey.
- 3.11.06 Show all general and construction notes.

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3.11.07 All street light cable shall be copper.

3.12 Storm Drain Plans and Profiles

All storm drain plans and profiles shall meet the requirements list below, close adherence to these requirements will expedite the review process.

3.12.01 All plan and profiles shall be drawn on 24" x 36" paper, with a maximum scale of 1" = 100' on plans, 1"=10' on profiles.

3.12.02 Show the location, size and slope of mains and lateral connections.

3.12.03 Show the location, size and details of inlets, junction boxes, etc.

3.12.04 Show northing and eastings of all storm drain fixtures.

3.12.05 Stationing of manhole center lines, lateral connections and crossings shall be shown on all plats and profiles.

3.12.06 Manhole size, location and flow line elevation, and lid elevation shall be provided.

3.12.07 Label all types of mainline pipe throughout the plan set.

3.12.08 Show profile of all other existing or proposed utilities with invert elevation, with type and size of each utility.

3.12.09 Show all existing utilities within and adjacent to area proposed for construction. Include actual existing elevations obtained from field survey/pot hole where potential conflicts, cover, or clearance requirements exists.

3.12.10 Provide details at 1"=10' or other appropriate scale to adequately provide required information.

3.12.11 Show all benchmark locations and elevations (use State Plane Coordinates, Utah Central Zone, NAD 83).

3.12.12 Existing Surface Profile and grades shown with dashed lines.

3.12.13 Box type (clean-out box, catch basins, etc.) should reference appropriate City standards.

3.12.14 Cleanout boxes shall be placed:

1. Not more than 400 feet apart.
2. At every change in alignment or slope.
3. At junctions with other lines.

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4. So the invert of all pipes entering cleanouts shall never be below the invert of the pipe leaving the cleanout.
5. Cleanout boxes shall be designed to accept flow from less than or equal to 2 acres.

3.12.15 Catch basins shall be placed:

1. No more than 400 feet apart.
2. At low points of vertical curves and low points of downgrade cul-de-sacs or dead ends a double inlet box may be required.
3. Before drainage water flows around any corner curve.
4. To collect large developed area's storm water runoff. The typical bicycle safe inlet grate is assumed to have an inlet capacity of 2.5 cfs. In areas with significant slopes, capacity shall be calculated.

3.12.16 Show all invert elevations of all boxes.

3.12.17 Show flowline elevations of pipes and boxes.

3.12.18 Pipe type, size, slope and length shall be shown in the storm drain profile.

3.12.19 Any utility conflicts shall be shown in the storm drain profile.

3.12.20 Provide hydraulic grade line for the 10-year, 24-hour storm event. Velocity in storm drain pipelines shall range between 2½ feet per second minimum to 15 feet per second maximum when flowing half full.

3.13 Culinary Water Plans

All culinary water plans shall meet the requirements listed below. Other requirements may be required to ensure proper design of the culinary water within the development.

3.13.01 All plans shall be drawn on 24" x 36" paper, at a maximum scale of 1" = 100'.

3.13.02 Show the location and size of water mains, valves, hydrants, etc.

3.13.03 Show the type of pipe.

3.13.04 Provide details at 1"=10' or other appropriate scale to adequately provide required information.

3.13.05 Show all benchmark locations and elevations (use State Plane Coordinates, Utah Central Zone, NAD 83).

3.13.06 When development occurs across pressure zones include PRV stations in improvement designs.

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- 3.13.07 Show all existing utilities within and adjacent to the area proposed for construction must include actual existing elevations obtained from field survey. Pot holing at locations of potential conflicts, overlaps, or gaps shall be completed in the field survey.
- 3.13.08 Show all backflow prevention devices.
- 3.13.09 Show all general and construction notes.

3.14 Secondary Water Plans

All secondary water plans shall meet the requirements listed below. Other requirements may be required to ensure proper design of the secondary water within the development.

- 3.14.01 All plans shall be drawn on 24" x 36" paper, at a maximum scale of 1" = 100'.
- 3.14.02 Show the location and size of water mains, valves, drains, etc.
- 3.14.03 Show the type of pipe.
- 3.14.04 Provide details at 1"=10' or other appropriate scale to adequately provide required information.
- 3.14.05 Show all benchmark locations and elevations (use State Plane Coordinates, Utah Central Zone, NAD 83).
- 3.14.06 When development occurs across pressure zones include PRV station in improvement designs. Show all inlet and outlet pressures.
- 3.14.07 Show all existing utilities within and adjacent to the area proposed for construction must include actual existing elevations obtained from field survey.
- 3.14.08 Pot holing at locations of potential conflicts, overlaps, or gaps shall be completed in the field survey.
- 3.14.09 Show all backflow prevention devices.
- 3.14.10 Show all general and construction notes

3.15 Details and Typical Sections

Detail sheets or references to the current APWA Manual of Standard Plans are required for all details. Typical Sections should be drawn in accordance with Herriman City Standard Plans as shown in *Section 6* of this standard document.

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3.16 Landscaping Plans

All landscaping plans shall meet the requirements listed below.

- 3.16.01 Show an overall landscaping plan.
- 3.16.02 All landscape plans shall correspond with the proposed irrigation plan to ensure proper irrigation and landscaping design.
- 3.16.03 Show the location and type of all trees, shrubs and other vegetation.
- 3.16.04 Show all areas of improvements.
- 3.16.05 Show proposed location of all park equipment and facilities, including:
 - 1. Picnic tables.
 - 2. Park benches
 - 3. Playground equipment.
 - 4. Any building or other facility.
- 3.16.06 The park shall be accessible.
- 3.16.07 Show details of all park equipment.
- 3.16.08 Show the proposed grading of the landscaped area.

3.17 Irrigation Plans

All irrigation plans submitted shall meet the requirements list below.

- 3.17.01 The plan shall be drawn on 24" x 36" paper, with a maximum scale of 1" = 10'.
- 3.17.02 Show location and types of all irrigation fixtures including all valves, timers, heads, backflow devices, quick connects, Y strainers, etc.
- 3.17.03 Show size and type of pipe proposed.
- 3.17.04 Show all nozzle sizes proposed.
- 3.17.05 Show bubblers at all tree locations.
- 3.17.06 Show all proposed landscaping. The line type shall be clearly legible but lighter than the irrigation plan.

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- 3.17.07 In water zones where secondary water is required, plans are required to show how secondary water will be tied into the irrigation system if culinary water is temporarily used for irrigation.

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Section 4 outlines design criteria that will be required by developments and developers engineer. All submitted plans shall meet at a minimum the criteria provided and use the highest engineering practices. Developers engineer will be required to use design criteria unless otherwise specified by City Engineer.

4.01 Easements and Agreements.

All required easements and agreements shall follow the requirements listed below.

- 4.01.01 Easements for culinary water, sewer, power, irrigation water, storm water drainage, wetlands, and/or other utilities or purposes shall be provided by the Developer and designated on the improvement plans and final plat or separate document as require to accommodate the utility systems in the development. Where natural drainage channels, interceptor systems, or flood hazard or sensitive area overlay zones cross the development, the developer must obtain the necessary permits to modify such drainage facilities, and designate the channels, systems, or flood hazard zones, and any associated restrictions, on the plat as well as provide the necessary easement dedication.
- 4.01.02 Easements and area descriptions shall be of sufficient width to completely identify and provide for access and maintenance of the utility or identified restricted area.
- 4.01.03 Easements to be dedicated to Herriman City which are not shown and described on the dedication plat shall be submitted to the City Engineer on forms provided by the City. Said easements shall include, by attachment, a drawing of the easement being dedicated and a complete legal description of the easement.
- 4.01.04 Under no circumstance shall permits be issued or construction allowed without the proper easements in place to accomplish the work.
- 4.01.05 Should easements become necessary to cross abutting private property to permit drainage or utility access of the development, it shall be the responsibility of the developer to acquire such easements at no cost to the City.
- 4.01.06 Both legal and physical accesses are required to all manholes, cleanouts, valves, or other structures requiring periodic maintenance. Physical access shall consist of all weather surfaces sufficient to allow of all routine maintenance and repair equipment.

4.02 Traffic Impact Study Guidelines

A traffic impact study may be required on developments that generate 100 or more new peak hour trips or as determined by the City Engineer. The guidelines for all traffic impact studies conducted within Herriman City are discussed below.

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- 4.02.01 **Introduction.** New land developments, expansions of existing developments, and proposed changes in developments (redevelopments) can have a significant impact on the transportation system if there is not adequate planning and consideration of necessary improvements. To ensure that Herriman City can accommodate a proposed development, a Traffic Impact Study (TIS) is required to analyze relevant impact issues. The purpose of this document is to establish uniform guidelines for when a TIS is required and how the study is to be conducted, based on criteria established by the *Institute of Transportation Engineers* (ITE).
- 4.02.02 **General Requirements.** A TIS is a specialized study of the impacts that a certain development will have on the surrounding transportation system. The study will analyze all transportation modes, but is specifically concerned with the generation, distribution, and assignment of traffic to and from the proposed development. The impact analysis area will generally be larger than the immediate site. A TIS shall be required for all developments which generate 100 or more new peak hour trips or which will have a significant impact on the City's transportation system as determined by the City Engineer. Further, the TIS shall follow the Report Outline provided herein and shall bear the stamp of a Civil or Traffic Engineer registered in the State of Utah. It will be critical for the Engineer performing the study to regularly consult and coordinate with the City Engineer. At least one meeting between the City Engineer and the Engineer who performed the study will be required to review traffic impacts. Additional meetings will be required at the City Engineer's discretion. The developer will be responsible for hiring the engineer to perform the TIS.
- 4.02.03 **Existing Background Information.** The Developer's Engineer needs to obtain weekday A.M. and P.M. peak hour traffic counts at key locations in the vicinity of the proposed project. These counts need to show turning volumes as well as through movement. Turning movement counts may be required during other periods (e.g. Saturday Peak Hour) as directed by the City. The traffic volumes can either be obtained by traffic recorders (i.e., manual, pneumatic) or by using existing traffic counts which are not more than one year old. Traffic volumes for some areas can be obtained from Herriman City. Requests for volumes should be coordinated through the City Engineer. When directed by the City, the traffic volumes for the analysis hours should then be adjusted for the peak season, in cases where seasonal traffic data is available. Herriman City requires that the TIS contain a table including the A.M. and P.M. peak hours at all intersections and accesses which are included in the study area. Data regarding roadway and intersection geometrics, and traffic control devices should also be collected within the study area and provided in the TIS.
- 4.02.04 **Non-Site Traffic Forecast.** When the existing peak hour traffic has been identified and developed, then the future year background traffic volumes can be developed. This traffic is the non-site traffic which consists of the existing ADT and the generated traffic of all other existing developments in the area. There are many different methods for calculating the background traffic. One method is to use travel demand models of the area. A notable model is provided by the Wasatch Front Regional Council. Another method available is to use growth rates or trends. Growth

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projections for future years must be based on documented historical data for the study area. The method which is chosen by the consultant to develop the background traffic needs to be approved by the City Engineer. In addition to the existing traffic growth projections, it may also be required to add in the potential traffic increases due to other developments. These developments consist of the planned and anticipated developments which are in the area. In addition, some assumptions for development of other vacant lands in the vicinity of the project need to be identified and included in the total background non-site traffic. This additional traffic is important in areas where developmental growth may not be represented sufficiently in the traditional growth trends. The City Engineer should be consulted to determine requirements for assessing other development in the TIS report.

- 4.02.05 **Site Traffic Generation.** The latest edition of ITE's *Trip Generation* Manual should be used for selecting trip generation rates. Other rates may be used with the approval of the City in cases where *Trip Generation* does not include trip rates for a specific land use category, or includes only limited data, or where local trip rates have been shown to differ from the ITE rates. Site traffic should be generated for daily, A.M., and P.M. peak hour periods. Internal Capture and pass-by trip reductions may be allowed in some cases, but the final assumption for trip reductions and any other adjustments must be reviewed and accepted by the City Engineer. A trip generation table should be prepared by phase showing proposed land use, trip rates, and vehicle trips for daily and peak hour periods and appropriate traffic volume adjustments, if applicable.
- 4.02.06 **Site Generated Traffic Distribution and Assignment.** The project generated traffic needs to be assigned and distributed onto the existing street network in order to accurately analyze the effects of the proposed development or land use change. Any of the distribution and assignment methods recognized by ITE are acceptable. A Trip Distribution diagram is required in the TIS report. Trip assignments can be developed with computer models or by manual calculations. All assignment assumptions must be agreed to by the City Engineer and reflect the distribution pattern developed.
- 4.02.07 **Traffic Flow Diagrams.** All intersections which are in the study area, and all accesses to the proposed development or land use change require a traffic flow diagram. Diagrams showing generated trips, background traffic, and the combined volumes of both background and generated traffic are necessary for each intersection/access for each analysis year. This includes both through movements as well as turning volumes.
- 4.02.08 **Impact Analysis Area.** The study area needs to include all streets which serve the proposed development or land use change. In general, any links that will experience a directional increase of 25 vehicles in the peak hour should be included in the study. However, the City Engineer may enlarge or reduce the study area based on project type, size, or other special conditions.

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4.02.09 Time Period, Study Horizon Years, and Traffic Scenarios. Both the A.M and P.M. peak hour periods must be analyzed with and without the addition of each proposed project phase. The study horizon should include the current year (to model existing conditions), year(s) of completion of a major phase or build-out, and a future date of 5 to 10 years beyond build-out. Both a build and a no-build alternative should be analyzed for each year. The current year only needs the no-build analysis. Further, an analysis of the proposed project with TIS mitigation measures should be made when a level-of-service (LOS) E is encountered from existing (and/or future) plus project traffic at any location within the study area. If LOS D occurs, it must be identified and may require mitigation as determined by the City Engineer. Moreover, the improvements assumed by the traffic engineer for analysis must be approved by the City Engineer. The City Engineer must also approve of all traffic scenarios that will be analyzed before a TIS can be submitted and may dictate which horizon years are appropriate for study. The table below is a list of study horizons that should be used determined by project type and size.

Analysis Category	Development Characteristic	Study Horizons	Minimum Study Area
I	Small Development 100-499 peak hour trips	1. Opening Year 2. 5 years after Opening	1. Site Access Drives 2. Adjacent signal controlled intersections within 1/4 mile and/or major street intersections without control and driveways within 500 feet
II	Moderate Development 500-999 peak hour trips	1. Opening Year 2. 5 years after Opening	1. Site Access Drives 2. All signal controlled intersections within 1/2 mile and/or major street intersections without signal control and major driveways within 1/2 mile
III	Large Development 1,000 - 1,500 peak hour trips	1. Opening Year 2. 5 years after Opening	1. Site Access Drives 2. All signal controlled intersections within 1 mile and/or major street intersections without signal control and major driveways within 1 mile
IV	Regional Development >1,500 peak hour Trips	1. Opening Year 2. 5 years after Opening 3. 20 years after Opening	1. Site Access Drives 2. All signal controlled intersections within 1 mile and/or major street intersections without signal control and major driveways within 1 mile

4.02.10 Analysis Topics. The following items require analysis:

1. LOS for all Intersections and Access Points for Each Analysis.
2. LOS for Critical Links for Each Analysis Year.
3. Left-Turn Warrants.
4. Signal Warrants.
5. Weaving and Merge Analysis.
6. Sight Distance.
7. Queue Length Analysis.
8. Impacts to Other Transportation Modes (bicycle, pedestrian, and transit).
9. Signal Progression.

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10. Acceleration/Deceleration Lanes.
11. Transportation Demand Management (TDM) Measures.
12. Any Mitigation Measures Suggested by the Consultant.
13. Geometrics (must meet current Transportation Master Plan Standards or Those Approved by the City).
14. Air Quality.
15. Internal Circulation and Stacking.
16. Driveway Conflicts.

4.02.11 **Analysis Guidelines.** Level of service (LOS) shall be computed for signalized and unsignalized intersections in accordance with the latest edition of the *Highway Capacity Manual*. The intersection LOS should be calculated for each of the following conditions (if applicable):

1. LOS for All Intersections and Access Points for Each Analysis Year.
2. Existing AM/PM Peak Hour Traffic Volumes (diagram required).
3. Existing AM/PM Peak Hour Traffic Volumes Including Site Generated Traffic (diagram required).
4. Future Peak Hour Traffic Volumes Without Site Traffic (diagram required).
5. LOS Results for Each Traffic Volume Scenario (table required).

The LOS table should include LOS results for AM and PM peak periods. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections, and LOS conditions for the critical movements at unsignalized intersections. For signalized intersections, the LOS conditions and average vehicle delay shall be provided for each approach and the intersection as a whole.

As previously stated, if the new development is scheduled to be completed in phases, the TIS must, if directed by the City, include an LOS analysis for each separate development phase in addition to the TIS for each horizon year. The incremental increases in site traffic from each phase should be included in the LOS analysis for each preceding year of development completion. A figure will be required for each horizon year of phased development.

Where an intersection, segment, or approach LOS of E occurs, it should be mitigated to LOS D or better. If LOS D occurs, it must be identified and may require mitigation as determined by the City Engineer. The results of these mitigated analyses should also be shown in a table for comparison purposes.

Copies of all calculations and analysis results are required to be submitted as an appendix to the TIS report. This is to include all capacity analyses and all warrants analyses for each study year.

4.02.12 **Site and Off-Site Improvements.** A detailed vicinity map and a proposed site plan for the development are also required in the study. The site plan or TIS should include schematic drawings and show the following:

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1. All access locations to the site (include dimensions and cross section).
2. All impacted intersections in the study area.
3. Any existing or proposed signals and appropriate timing information.
4. Proposed highway or local street improvements (e.g. alignment, added lanes, and cross section).
5. Bicycle, pedestrian and public transit considerations and plans.
6. Site circulation patterns and parking.
7. All proposed improvements must be checked for conformance with land use and access control requirements.

4.02.13 **Recommendations and Conclusions.** This section of the study report will be where the engineer's recommendations for mitigation measures will be detailed. A summarized version should be located in the executive summary section of the report. The mitigation measures should be addressed individually. Their efforts to improve the impacts of the development or land use action need to be explained and illustrated. An example is how the addition of a traffic signal at an access location will improve the level of service for the access while not hindering traffic progression.

4.02.14 **Herriman City Review and Conceptual Approval of the TIS Report.** City staff must review and approve the contents and conclusions of the TIS report. Three copies of the report must be submitted to the Herriman City Engineer. Regular contact and consultation with City staff throughout the process is recommended to resolve issues early and save costly engineering and time delays later on. Refer to the report format for a suggested TIS outline.

4.02.15 **Report Format.** The following outline is a guide for preparation of the Traffic Impact Study report. Some studies will be easily documented using this outline. However, additional sections may be warranted because of specific issues or results of the study. Likewise, inapplicable sections listed in the outline may be omitted from the report.

- I INTRODUCTION AND SUMMARY
 - A. Purpose of Report and Study Objectives
 - B. Executive Summary
 - 1. Site Location and Study Area
 - 2. Development Description
 - 3. Principal Findings
 - 4. Conclusions / Recommendations
 - 5. Recommendations
- II PROPOSED DEVELOPMENT
 - A. Off-site Development
 - B. Description of On-Site Development
 - 1. Land Use and Intensity
 - 2. Location (Vicinity Map)
 - 3. Site Plan and Access Locations

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- 4. Zoning
- 5. Development Phasing and Timing
- III STUDY AREA CONDITIONS
 - A. Study Area
 - 1. Area of Significant Traffic Impact
 - 2. Influence Area
 - B. Study Area Land Use
 - 1. Existing Land Use and Zoning
 - 2. Anticipated Future Development
 - C. Site Accessibility
 - 1. Existing and Future Area Roadway System
 - 2. Traffic Volumes and Conditions
 - 3. Access Geometrics
 - 4. Other as applicable
- IV ANALYSIS OF EXISTING CONDITIONS
 - A. Physical Characteristics
 - 1. Roadway Characteristics
 - 2. Traffic Control Devices
 - 3. Pedestrian/Bicycle Facilities
 - B. Traffic Volumes
 - 1. Daily, Morning, Afternoon, and Saturday Peak Periods (as applicable)
 - C. Level of Service
 - 1. Morning, Afternoon, and Saturday Peak Hour (as applicable)
 - D. Safety
- V PROJECTED TRAFFIC
 - A. Site Traffic (Each Horizon Year)
 - 1. Trip Generation
 - 2. Mode Split
 - 3. Pass-by Traffic (if applicable)
 - 4. Internal Capture (if applicable)
 - 5. Trip Distribution
 - 6. Trip Assignment
 - B. Non-Site Traffic Forecasting (Each Horizon Year)
 - 1. Projections of Non-Site (Background) Traffic (methodology shall receive prior approval of City)
 - C. Total Traffic (Each Horizon Year)
- VI TRAFFIC AND IMPROVEMENT ANALYSIS
 - A. Site Access
 - B. Capacity and Level of Service Analysis
 - 1. Without Project (for each horizon year including any programmed improvements)
 - 2. With Project (for each horizon year, including any programmed improvements)
 - C. Roadway Improvements

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1. Improvements Programmed to Accommodate Non-site (Background) Traffic
2. Additional Alternative Improvements to Accommodate Site Traffic
- D. Traffic Safety
 1. Sight Distance
 2. Acceleration/Deceleration Lanes, Left-Turn Lanes
 3. Adequacy of Location and Design of Driveway Access
- E. Pedestrian Considerations
- F. Speed Considerations
- G. Traffic Control Needs
- H. Traffic Signal Needs (base plus each year, in five-year horizon)
- I. Site Circulation and Parking
- VII FINDINGS
 - A. Site Accessibility
 - B. Traffic Impacts
 - C. Need for Improvements
 - D. Compliance with Applicable Local Codes
- VIII RECOMMENDATIONS/CONCLUSIONS
 - A. Site Access/Circulation Plan
 - B. Roadway Improvements
 1. On-Site
 2. Off-Site
 3. Phasing (as applicable)
 - C. Other
- IX APPENDICES
 - A. Existing Traffic Volume Summary
 - B. Trip Generation/Trip Distribution Analysis
 - C. Capacity Analyses Worksheets
 - D. Traffic Signal Needs Studies
- X FIGURES AND TABLES
 - A. The following items shall be documented in the text or Appendices
 1. Site Location
 2. Site Plan
 3. Existing Transportation System
 4. Existing AM/PM Peak Hour Turning Volumes
 5. Estimated Site Traffic Generation
 6. Directional Distribution of Site Traffic
 7. Site Traffic
 8. Non-Site Traffic
 9. Total Future Traffic
 10. Projected Levels of Service
 11. Recommended Improvements
- XI DESIGN STANDARD REFERENCE
 - A. Design in accordance with current Herriman City Standards.

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- B. Conduct capacity analysis in accordance with the latest edition of the *Highway Capacity Manual*.
- C. Use the Herriman Transportation Master Plan as a guide for street classification and general transportation goals.
- D. Conduct signal warrant analysis in accordance with the latest edition of the *Manual of Uniform Traffic Control Devices (MUTCD)*.
- E. Use the State of Utah Access Management Standards, Wasatch Front Regional Council's *Access Management Techniques for Local Governments* and AASHTO's *A Policy on Geometric Design of Highways and Streets, 2001* as additional guides for access management policy.

4.03 Environmental Site Assessment

In 2001 the Environmental Protection Agency issued a record of decision regarding the environmental mitigation that occurred in Herriman under an Emergency Response Action. Certain properties were tested and found high levels of lead and arsenic. As properties develop, some properties that have been tested shall follow a procedure for clean up prior to development of the property. The City has information on areas that have or are suspected to have lead and arsenic contamination. The clean up levels can be seen in the list below for each specific type of use:

Area Types	Lead (ppm)	Arsenic (ppm)
Residential	1,600	100
Commercial (Except Day Care)	1,500-4,000	250-850
Industrial	1,500-4,000	250-850
Recreation / Open Space	3,000-10,000	250-300
Agricultural	10,000	300

In 2001 the Environmental Protection Agency tested numerous properties and the levels found were documented and are on file at the City. Some properties were not tested and may be required to conduct tests to determine the property's individual lead and arsenic levels. In some areas, additional testing may be required to determine depths of lead and arsenic levels. If it is determined that lead and arsenic levels are present or suspected, the developer shall submit a remediation plan. See *Section 4.03.01* for plan requirements. After the remediation plan is reviewed and approved by the City a preconstruction meeting shall be held and then the site may be remediated. The developer shall be responsible for all quality control and assurance that the site is cleaned to appropriate levels. After cleanup is complete, a final report shall be submitted to the City stating how cleanup was initiated and any additional information found during the remediation process. See *Section 4.03.02* for Final Report requirements.

4.03.01 Remediation Plan. The remediation plan shall be reviewed by the City. All plans shall discuss what levels are present on property and how the site will be remediated and what precautions and sampling will be conducted to ensure property is cleaned to the appropriate levels. The remediation plan shall show at a minimum:

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1. Site Location
2. Site History and Previous Investigations
3. Proposed Use
4. Cleanup Goals
5. Site Health and Safety
6. Site Security
7. Work Plan / Removal Procedures
8. Air Monitoring and Dust Control
9. Storm Water Pollution and Prevention Plan
10. Confirmation Sampling
11. Post Remedial Management
12. Quality Assurance Plan

4.03.02 **Final Remediation Report.** After remediation efforts have been completed the developer shall submit a report outlining the remediation process. This report shall show the following at a minimum:

1. Results
2. Methods
3. Deviation from plan

4.03.03 **Development of Contaminated Properties.** For additional information on the City's requirements for development of contaminated properties, please refer to "Development of Contaminated Properties: Procedures of Herriman City". A copy is available from the Engineering Department and it is also posted on the City's website.

4.04 Grading and Drainage Design

Grading and drainage shall be designed according to the requirements listed below.

- 4.04.01 Fill slopes shall be no steeper than 3 horizontal to 1 vertical (3:1), or as determined by a soils engineer. All fills shall be compacted to a minimum of 95 percent of maximum density.
- 4.04.02 Cut slopes shall be no steeper than 3 horizontal to 1 vertical (3:1), or as determined by a soils engineer.
- 4.04.03 An Erosion Control plan must be incorporated into the project to minimize soil erosion and to avoid sedimentation into the City storm system.
- 4.04.04 All public streets shall be maintained, free of dust and mud caused by grading or construction operations.
- 4.04.05 Compaction tests are required on all engineered fill and other locations which will be load bearing. All testing shall comply with the specification of Herriman City.

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- 4.04.06 All building pads at rough grade shall have a 1% slope from the pad towards the street or designed drainage outlet.
- 4.04.07 Test holes shall be dug at a location which represents the development site adequately to determine the depth of the groundwater table. A preliminary soils investigation and groundwater report shall be submitted to the City Engineer. If the City Engineer determines that groundwater is a problem, a lateral to each lot for footing or foundation drains, shall be installed to city specifications. All land drains must be tied into approved storm drain facilities.
- 4.04.08 Dust shall be controlled during all phases of construction either by means of a water truck or other approved method.
- 4.04.09 The minimum finished slope of any designed grade shall be 1% for soil, asphalt or gravel and 0.40% for concrete.
- 4.04.10 Subsurface drainage systems shall be of adequate capacity to intercept and convey the drainage so as not to detrimentally affect adjacent properties or public infrastructure.
- 4.04.11 Subsurface drainage manhole spacing shall be 400 feet maximum.
- 4.04.12 Subsurface drainage design and construction methods must adequately address potential problems which may arise during construction or by design so as not to pollute, erode, deposit sediment, or cause any other degradation to existing natural condition.
- 4.04.13 All subsurface drainage installation shall comply with the City's Specifications.
- 4.04.14 Should the installation of a subsurface drainage system require easements the developer of such system shall obtain and convey such easements by deed to Herriman City.
- 4.04.15 Clearance between other utilities shall be at least 18 inches. Closer tolerances may require concrete reinforcement or other acceptable separation.

4.05 Erosion Control Design

An erosion control plan shall be submitted and approved for all developments. The requirements for erosion control plans shall follow the requirements listed below.

- 4.05.01 Projects disturbing one acre or more must file a Notice of Intent with the Utah Division of Water Quality prior to construction. A copy of the erosion control plan must be kept on site until construction is complete.

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- 4.05.02 An Erosion Control plan must be incorporated into projects to minimize soil erosion and to avoid sedimentation into the City storm sewer system, onto adjacent properties or into natural drainage courses.
- 4.05.03 Erosion control devices shall consist of one or more of the following: check dams, sand bags, hay bales, desilting basins, silt fences, berms, dikes, contour grading, or other approved devices.
- 4.05.04 Erosion control devices shall be modified as needed as the project progresses, and plans of these changes shall be submitted for approval.
- 4.05.05 All public streets and storm drain facilities shall be maintained free of mud and debris caused by grading or construction operations.
- 4.05.06 Graded areas adjacent to fill slopes located at the site perimeter must drain away from the top of the slope at the conclusion of each working day.
- 4.05.07 All loose soil and debris which may create a potential hazard to offsite property shall be fully protected onsite to prevent any damage or be removed from the site as directed by the Inspector.
- 4.05.08 Desilting basins or excavated pits are required prior to discharge into any private or public street, into any City, State, or County storm system, onto adjacent properties or into natural drainage course.
- 4.05.09 Desilting basins may not be removed or made inoperable without the approval of the Inspector.
- 4.05.10 All silt and debris shall be removed from all devices within 24 hours after each storm event.
- 4.05.11 All utilities must be protected to prevent damage due to erosion. Should damage occur, it shall be the responsibility of the developer to repair such damage at no cost to such utility and within a reasonable period.
- 4.05.12 Erosion control devices shown on the approved plan may be removed when approved by the Inspector if the grading operation has progressed to the point where they are no longer required.
- 4.05.13 Provide any additional information required by the State to receive the UPDES permit.
- 4.05.14 File for and receive approval for the UPDES permit.

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4.06 Street Design

The standards outlined in this section can be supplemented by AASHTO, *A Policy on Geometric Design of Highways and Streets*. In cases of conflict, a determination shall be made by the City Engineer.

- 4.06.01 The vertical alignment shall be such as to minimize grade breaks along the centerline and curb lines. Allowable grade breaks shall not exceed 1% for local streets and minor collectors, and 0.5% for major collectors and arterials. Eliminate grade breaks in excess of the above criteria by means of a vertical curve of seventy feet (70') minimum for local streets and three hundred feet (300') for major arterials. All vertical curve lengths shall be dependent upon three factors: (1) Design speed, (2) algebraic differences in grades and (3) a design constant (k).
- 4.06.02 Minimum slope allowed is 0.4% (applies to all gutter grades).
- 4.06.03 Maximum longitudinal slope along centerline shall be 8% on arterial public streets; 10% on local and collector streets, unless justification is submitted and approval is granted for a steeper slope. All slopes steeper than 8% shall be designed in a curvilinear alignment in order to convey traffic from steep slopes in a safe and efficient manner.
- 4.06.04 All roadways shall be designed in accordance with the following design speeds using AASHTO's guidelines, principles, and practices. Exceptions to the design speeds must be received in writing from the city engineer:
1. Local: Twenty five (25) miles per hour;
 2. Collector: Forty (40) miles per hour;
 3. Arterial: Fifty (60) miles per hour.
- 4.06.05 Superelevation rates above 0.04 ft./ft. shall be prohibited. Superelevation will not be allowed on local residential streets.
- 4.06.06 Where a centerline deflection angle of more than ten degrees (10°) occurs, a circular curve shall be introduced. There shall be a tangent of at least fifty feet (50') on local streets and one hundred feet (100') for collector and arterial streets between reverse curves.
- 4.06.07 Right-of-Way and Pavement Design. The following are the minimum pavement designs required by the City:

<u>Road Classification</u>	<u>Minimum Pavement Design</u>
Local and Private	8" base 3" asphalt
Collector	10" base 4" asphalt
Arterial	12" base 6" asphalt

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- 4.06.08 All roadway sections designs shall include a soils report with a recommended pavement design. The City shall require the stronger of the recommended and the City minimum pavement design.
- 4.06.09 Driveways. All property shall be limited to the following number of street driveway entrances:
1. For the first two hundred feet (200') of property frontage along a street, a maximum of two (2) driveways, except that single-family dwellings shall be permitted only one access unless a circular driveway is utilized.
 2. For each additional one hundred fifty feet (150') of property frontage along a street, a maximum of one additional driveway, except for single-family dwellings, which shall have no additional driveways unless approved by the city engineer. In no case shall more than fifty percent (50%) of the property frontage along the street be used for driveway purposes.
- 4.06.10 All driveway grades shall not exceed ten percent (10%) within twenty feet (20') of the roadway boundary.
- 4.06.11 There shall be a minimum ten feet (10') distance between all approved driveways.
- 4.06.12 Driveways shall be a minimum of five feet (5') from a side property line at the front lot line.
- 4.06.13 All Drive approaches shall be a minimum of five (5') from all fire hydrants, signs, trees, light poles, water meters, utility boxes, and all other items located in park strips or, the public right of way or utility easements.
- 4.06.14 Additional requirements for residential driveways (except multiple-family):
1. The minimum street driveway width at the property line for a driveway shall be ten feet (10') and the maximum shall be thirty five feet (35').
 2. There shall be a minimum of thirty five feet (35') between the entrances of circular driveways.
 3. A minimum five foot (5') radius or flared section shall be used.
 4. No radius or flare portion of a driveway shall intersect the adjacent projected property line except where shared driveways are utilized.
 5. On corner lots, driveways shall be set back a minimum of twenty feet (20') from the point of intersection of the right of way lines.

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- 4.06.15 Additional requirements for commercial, industrial and multiple-family driveways:
1. On corner lots driveways shall be set back a minimum of sixty feet (60') from the projected intersection right of way lines with a minimum of five foot (5') flared section. Flared driveways are required for distinction from intersection corners.
 2. The minimum width of a driveway shall be twelve feet (12') and the maximum shall be fifty feet (50').
- 4.06.16 Intersection Design. The minimum radius of curb return on local streets in residential areas shall be twenty five feet (25'). A larger radius shall be used in industrial areas or higher functional classification streets as approved by the county engineer in accordance with AASHTO guidelines.
- 4.06.17 Streets shall intersect at an angle of ninety degrees (90°) where possible. Any intersection design other ninety degrees (90°) shall require a written approve from the city engineer.
- 4.06.18 Offset intersections shall be avoided whenever possible and offsets shall be provided with minimum distances between center lines as follows:
1. Local Streets: One hundred fifty feet (150').
 2. Collectors: Five hundred feet (500').
 3. Arterials: Eight hundred feet (800').
- 4.06.19 Left turns maybe prohibited within two hundred feet (200') of major intersections either by signs or concrete medians.
- 4.06.20 Private Roadways. The width of all private roadways shall consist of a minimum of twenty feet (20') of unobstructed travel surface. Roadways shall be twenty five feet (25') wide where they form cul-de-sacs greater than five hundred feet (500') in length. Short sections may be reduced to preserve trees or other features as approved by the fire marshal. "Hammer head" turn around can be approved by the City and the fire marshal.
- 4.06.21 All surfaces shall consist of an approved design capable of carrying twenty four (24) ton vehicles.
- 4.06.22 Except as modified by subsections 4.06.20 and 4.06.21 of this section, all private roadways shall comply with the requirements of this chapter.
- 4.06.23 Intersecting street angles may vary between 85 and 95 degrees.

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- 4.06.24 Roadway structural section shall be determined by the Developer's soil test engineer. A soils investigation shall be submitted that includes:
1. Soil borings along roadway centerline and other areas (as may be needed).
 2. Analysis on the overall bearing capacity of the soil.
 3. Recommendation for structural street cross section.
 4. Recommendation as to the requirements for land drains to adequately collect groundwater which could adversely affect development.
 5. Cut and fill slope requirements.
 6. Compaction requirements.
- 4.06.25 Curve data is required for all centerline and curb line curves and also for all curb returns within intersections.
- 4.06.26 Minimum centerline radius of 200' is required on all collector and higher classification streets. Local streets shall be designed with a minimum centerline radius of 100' unless otherwise waived by the City Engineer to provide a means for traffic calming. No angle points shall be allowed along centerlines except as allowed within intersections.
- 4.06.27 Minimum centerline radius for collectors and arterials shall be based on the design speed but in no case shall be less than a 200' radius.
- 4.06.28 Minimum tangent between curves with a length of twice the right-of-way width is required along the centerline of all public roads.
- 4.06.29 Temporary turnarounds shall be required on all streets which shall be extended in the future and which exceed 150 lineal feet from the centerline intersections of the closest intersecting street. Additional right-of-ways or easements necessary to construct and maintain the temporary turnaround are also required.
- 4.06.30 If possible the horizontal alignment should be straight through the intersections, but where horizontal curves cannot be avoided, the following should be observed:
1. Use a curve of sufficient radius to provide adequate sight distance and minimize the need for superelevation. Under no condition should the curve radius be less than that required for the street classification.
 2. Do not begin or end a curve within an intersection
 3. Eliminate angle points in excess of 2 degrees on major or secondary roads by use of a large radius curve.
 4. Angle points up to 5 degrees are permissible at the intersection of two local streets.
 5. Curve radii and superelevation should consider the design speed for the given road.
- 4.06.31 In cases where unusual topographical, aesthetic or other exceptional conditions or circumstances exist, variations or exceptions to the requirements of this chapter may

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be approved by the City Council after receiving recommendations from the planning commission and the City engineer; provided, that the variations or exceptions are not detrimental to the public safety or welfare.

4.06.32 All public and private roadway development located within the City is subject to the jurisdiction of the City and shall meet the requirements of this AASHTO publication, "A Policy On Geometric Design Of Highways And Streets", most current edition. The City shall also require the utilization of the MUTCD manual. All public and private trails and paths shall comply with the AASHTO a guide for the development of bicycle facilities most current edition and ADA Accessibility Guidelines.

4.06.33 Back of curb radii for various street intersections is shown in the table below:

		Right of Way Width (feet)				
		50	60	66	80	106
Right of Way Width (feet)	50	25	25	25	30	30
	60	25	25	25	30	30
	66	25	25	30	30	30
	80	30	30	30	40	40
	106	30	30	30	40	40

4.06.34 **Street Arrangement.** The arrangement of streets in new developments shall make provision for the continuation of the existing streets in adjoining areas (or their proper protection where adjoining land is not subdivided, insofar as such may be deemed necessary for public use by the Herriman City Planning Commission). The street arrangement shall not cause unnecessary hardship to owners of adjoining property when they plat their own land and seek to provide convenient access to it.

1. Major Streets. Arterial and collector streets shall conform to the width designated on the *Standard Plan No. RD-01A* wherever a development falls in an area for which a Master Street Plan has been adopted. For areas where the street plan has not been completed at the time the preliminary plan is submitted to the Planning Commission, arterial or collector streets shall be provided as required by the Planning Commission.
2. Local Streets. Local Streets shall have a minimum right-of-way width of 60 feet with a 66 foot right-of-way required for streets that will have greater use as determined by the City Engineer. Cul-de-Sacs, permanent dead end streets and other local streets which provide a small loop without intersecting other streets shall also have a minimum right-of-way of 60 feet.
 - a. The City may allow the 50 foot right of way section with the recommendation of the Planning Commission and approval of City Council.
 - b. The City Engineer may recommend a 50 foot right of way section in consideration of the following criteria:

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Recommended Criteria for 50' ROW Section
Less than 500 vehicles per day <ul style="list-style-type: none"> • 50 single family houses based upon accepted trip rates • 75 apartments based upon accepted trip rates
Greater than 8% grade but less than 1/2 mile in length
Greater than 10 ft. vertical cut/fill slope but less than 1/2 mile in length
Hillside overlay zone
Neighborhood collectors (60' roads) or larger on each side of the road
Connections to less than 5 intersecting roadways
Does not provide access to a church, school, park, clubhouse, commercial establishment, or other public use.
The geometrics of the road are conducive to the 50' section (i.e., no sharp corners, grades meet a 25 mph design speed, sight distances are all met, etc.)
Driveways are staggered to reduce parking across the street.

3. Minor Terminal Streets. Cul-de-sacs shall not be longer than 600 feet from the centerline of the adjoining street to the center of the cul-de-sac.
4. Turning Area. Where a street longer than 150 feet is designed to remain only temporarily as a dead-end street, an adequate turning area shall be provided as follows:
 - a. Dead end streets of length greater than 150 feet shall be required to have an all-weather surface turn-around with a minimum outside radius of forty-five (45) feet in residential areas and sixty (60) feet in commercial and industrial areas at the closed end.
 - b. Temporary ends of street in phased development must provide the width and all-weather surfaces but may omit curb and gutter on a turnaround.
 - c. A Temporary Turnaround Easement shall be required on the final dedication plat denoting the diameter of the turnaround as temporary until the road is extended at a future date. The dedication of the temporary turn-around must be signed by the property owner on which the turn-around is located. See *Standard Plan No. RD-03* for more information on cul-de-sacs and temporary turnarounds.
 - d. All 66 foot right of way roads and larger that are not fronted with property access require a 6' solid fence. For roadways between 66 feet and 80 feet, the fence must be a precast concrete fence if the parkstrip and sidewalks are less than 15 feet. All roadways 80 feet and larger must have a precast concrete fence.
5. Intersections. The intersection of more than two streets at one point shall not be allowed. Where such occur, roundabouts or traffic circles may be appropriate. Streets shall intersect at a 90 degree angle, or as near to a right angle as practicable, but not to exceed 5 degree deviation. See *Standard Plan No. RD-02* for more information on intersection.

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6. Standard Street Sections. All proposed streets, whether public or private, shall conform to the City Street Cross Section Standards as adopted by the City. (See *Standard Plan No. RD-01A, RD-1B, and RD-01C*).
7. Street Grades. Street grades over a sustained length shall not exceed the following percentages: on arterial public streets, 8%; on local and collector streets, 10%. In no event shall the street grades exceed those indicated, except where the topography makes it impracticable to keep within such grade, and where evidence, which is satisfactory to the City Engineer, is given that a lower grade is not possible. Street grades near intersections shall be designed for adequate stopping and starting by adjusting grades on both sides of the intersection. Grades of all streets shall be a minimum of 0.4% unless specifically authorized by the City Engineer. The cross slope of the street cross section is defined on the Standard Drawings. The maximum difference in curb elevations shall not exceed 1 foot, and then only with the approval of the City Engineer.
8. Alleys. Alleys shall have a minimum width of 20 feet. Alleys may be required in the rear of business lots, but will not be accepted in residential blocks.
9. Landings. A landing is defined as the area between the through street roadway and the point at which the side street grade begins to exceed 3%. The required minimum lengths of the landings are as follows:

Minor arterial	200 feet
Collector	100 feet
Local street	50 feet
Cul-de-sac	25 feet
10. Bridges. Design and construction of new bridges, whether essential for the overall circulation plan of the city or required only to serve a development, shall be approved in advance by the City. For bridges identified as essential structures to the City, the City may participate financially, and in the case of a bridge required to serve only a development, the developer shall pay the total cost of construction. The developer shall comply with all the conditions imposed by the City relative to the bridge location, design and construction. All bridge design shall be performed by a professional engineer as per applicable State laws.
11. Extra capacity improvements. Where developments install public improvements which benefit other properties and which exceed the minimum size required of his/her development, the Developer may enter into a pay back agreement with Herriman City. Protection or holding strips are no longer acceptable. Protection strips may be allowed only at the discretion of the Mayor, after recommendation of the Planning Commission, and in accordance with all city ordinances. An agreement, approved by the City Attorney, between the developer and Herriman City shall be executed. The duration of said agreement shall not exceed 10 years. The developer has a 10-year period in which to receive reimbursement from the affected properties. After expiration of the 10-year period or payment by adjacent property owner of the applicable consideration, the agreement shall be considered fulfilled. All

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property owned by the Developer shall be included on both the preliminary and final plan.

12. **Names and Numbers.** Names of new streets shall not duplicate existing or platted street names unless a new street is a continuation of, or in the alignment with, the existing or platted street. House number shall be assigned in accordance with the house numbering system now in effect in the city. All new streets shall be numbered if they are in alignment with the grid. They shall be named if not in alignment with the grid or are not easily aligned by their curved nature. Following approval of street names by the county, all street names and house numbers shall be reviewed and approved by the City. No lot address shall end in a zero or five; this designation is given to streets.
13. **Street Grading and Surfacing.** All public streets shall be graded and surfaced in accordance with the standards and specifications of Herriman City.
14. **Driveway Approaches.** All driveway approaches shall meet the specifications in the table below:

	Residential Driveways	Commercial/ Industrial Driveways
Minimum Width	10 feet	24 feet
Maximum Width	35 feet or 50% of lot frontage whichever is less	36 feet
Minimum Concrete	6 inches	8 inches
Minimum Base Course Thickness	6 inches	

15. **Driveway Location.** Driveways for all uses, except single-family homes, shall not be closer than eight feet (8') to an adjacent interior property line and shall be set back a minimum of eighty feet (80') from the intersection of two (2) arterial streets and fifty feet (50') from any other street classification intersection.
16. **Driveway Offsets.** All single family residential driveways shall be offset from other driveways by no less than twice the flare width as per APWA Standard Plans. All others shall have a minimum separation as shown in the following table and figure.

FUNCTIONAL CLASSIFICATION	MINIMUM DRIVEWAY SPACING (feet)		
	UPSTREAM AND DOWNSTREAM	OPPOSING UPSTREAM	OPPOSING DOWNSTREAM
ARTERIAL/FREEWAY INTERCHANGE AREAS	STATE OF UTAH HIGHWAY ACCESS MANAGEMENT STANDARDS APPLY		
MAJOR COLLECTOR	200	175	125
MINOR COLLECTOR	150	125	125
LOCAL	See driveway offsets	See driveway offsets	125

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NOTES:

1. AS DETERMINED BY THE CITY ENGINEER, ENGINEERING JUDGMENT SHALL OVERRIDE THE RECOMMENDED DIMENSIONS SET FORTH IN THIS TABLE IF WARRANTED BY SPECIFIC TRAFFIC CONDITIONS.
2. DRIVEWAY SPACING IS MEASURED AS SHOWN IN FIGURE 1.
3. CORNER CLEARANCE REQUIREMENTS FOR ACCESS POINTS SHOULD MEET OR EXCEED THE MINIMUM DRIVEWAY SPACING REQUIREMENTS.
4. FOR CORNER PROPERTIES, ACCESS TO PUBLIC STREETS SHOULD BE PROVIDED FROM THE LESSER (LOWEST FUNCTIONAL CLASSIFICATION) STREET.
5. DRIVEWAYS IN RIGHT TURN LANE TRANSITION AREAS SHOULD BE DISCOURAGED.

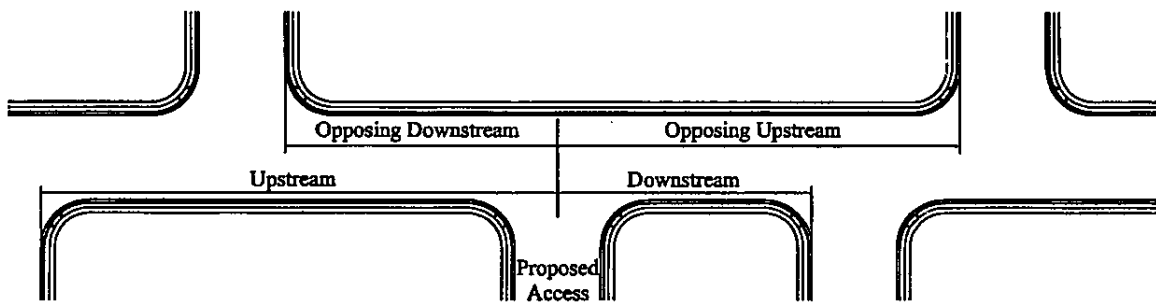


Figure 1: MEASUREMENTS FOR MINIMUM ACCESS SPACING STANDARDS

17. Common Driveways. Driveways along the property lines may be installed for common use of both adjacent properties only upon approval by the City Engineer and guaranteed by a recorded access agreement. Such driveway width shall be limited to the maximum allowable individual driveway width. Common driveway width may be extended by up to 10 feet for Commercial and Industrial zones.
18. Slopes. All cut and fill slopes shall be at a maximum 3:1 unless otherwise justified by a detailed soils investigation and approved by the City Engineer.
19. Street Trees or Shrubs. Street trees or shrubs are required along all streets within Herriman City. Tree and shrub varieties shall be approved by Herriman City. Spacing shall provide for at least one tree per lot with typical spacing of 40 feet on center. Shrub spacing shall be as directed by Herriman City. All landscaping shall be provided with a pressurized irrigation system and shall be connected to the adjacent lot's water system. Upon completion of the 18-month warrantee period the street trees or shrubs become property of Herriman City. The adjacent property owner is required to maintain the trees or shrubs according to applicable City ordinances.
20. Monuments. Permanent survey monuments shall be accurately set and established at the intersections of centerlines of streets within the development and intersections with centerlines of existing streets and the beginning and ends of curves on centerlines or points of interest or tangents. All permanent survey monuments shall remain in place, or be reset at the Developer's expense, when approved by the City Engineer. Monuments shall be of a type specified in the 2007 or current edition of the APWA. Plans, and all

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development plans shall be tied to a section corner or monument of record, as established by the Salt Lake County Surveyor.

21. **Sidewalk Ramps.** All sidewalk ramps shall be constructed to comply with a minimum standard as established by: The Americans with Disabilities Act (ADA), Americans with Disabilities Accessibility Guidelines (ADAAG), U.S. Federal Highway Administration, and the Manual on Uniform Traffic Control Devices (MUTCD). Current APWA Plan No. 235 and 236 will be used as a minimum guide for design of sidewalk ramps and construction inspection with the following exceptions:
 - a. **Detectable Warnings:** Detectable Warnings are to be installed to provide a distinctive surface of truncated domes detectable by cane or underfoot to alert people with vision impairment of the transition to vehicular ways. Truncated dome panels shall be installed at minimum of 4'-0" wide and a minimum depth of 2'-0". The panel shall be located so that the edge nearest the curb line (front of curb) or potential hazard is 6 to 8 inches from the curb line. All installed panels shall be a pewter, or dark gray color.
 - b. **Detailed Design:** At the discretion of the City, each sidewalk ramp may require detail engineering design. When areas throughout the City appear to be difficult to comply with ADAAG and may be difficult for the contractor to achieve construction requirements, the City will require engineering design to be performed and submitted to the City for ramp approval.
22. **Asphalt Design.** All developments shall submit a geotechnical report for each project to design the asphalt thickness. A minimum standard of 3 inches of asphalt on 8 inches of road base shall be used. All asphalt shall be designed in accordance with the Herriman City mix design. All streets, public and private, with right of way of 60 feet and smaller must use ½" mix design. Large streets must use ¾" mix design.
23. **Concrete Chip and Crack Standard.**
 - a. A section for sidewalk, curb and gutter is defined by existing joints. A sidewalk ramp is considered a section.
 - b. All concrete sidewalk, sidewalk ramps, and curb and gutter shall be removed and reconstructed if two or more cracks extend across the entire structure in any direction within a section.
 - c. All concrete sidewalk, sidewalk ramps, and curb and gutter shall be repaired for chips larger than ¼" in diameter. If more than five chips occur within one section of concrete, entire section shall be replaced.
 - d. All concrete sidewalk, sidewalk ramps, and curb and gutter shall be removed and reconstructed if a chip larger than ¾" in diameter is in the structure and a crack originates from the chip.
 - e. All concrete sidewalk, sidewalk ramps, and curb and gutter shall be ground and caulked if a crack is displaced and the displacement is less than 3/16" vertically or horizontally.

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- f. All concrete sidewalk, sidewalk ramps, and curb and gutter shall be removed and reconstructed if a crack is displaced more than 3/16" vertically or horizontally.
- g. All concrete sidewalk, sidewalk ramps, and curb and gutter shall be removed and reconstructed if spalling over ¼" deep has occurred over two square feet within a section of concrete.
- h. All winter repairs shall be bonded for, if needed, to insure the integrity of the repair.
- i. All requirements are guidelines for inspection. Inspectors may require additional repair/replacement if, in their opinion additional measures are required.
- j. All reconstructed sidewalk ramps shall be installed according to *Section 4.06.13* of the Herriman City Standards.

4.06.35 Street Signs. Street signed placed within Herriman shall be installed according to the stipulation listed below, and as shown on *Standard Plans RD-05 and RD-06*.

- 1. The Developer shall be assessed a sign fee which may be used by Herriman City to purchase materials, equipment and labor necessary to install street, regulatory and warning signs for the development.
- 2. Herriman City will purchase the materials, equipment and labor required to install the necessary street, regulatory and warning signs as directed by the Herriman City Engineer. Components of the signs will be in accordance with the standards, specifications and styles currently adopted by Herriman City for use in the municipal right-of-way. Specifically, signs will be installed by Herriman City in accordance with current MUTCD standards and the specifications set forth in APWA Section 32 01 05 and 32 01 06.
- 3. The Developer shall install all information signs and traffic control devices required in the development. All signs and traffic control devices shall be designed and installed according to the latest editions of the Manual on Uniform Traffic Control Devices (MUTCD) and APWA 32 01 05. The Developer shall pay all installation, material, equipment and labor costs associated with installation of the signs and traffic control devices. At the discretion of the Herriman City Engineer, the City may provide and install signs and traffic control devices in place of the Developer; in this case, the Developer shall reimburse Herriman City for all costs incurred for material, labor, equipment and installation. Sign and traffic control device costs shall be included in the bond for improvements of the development and will not be released until either installed by the developer or until payment for costs incurred by Herriman City has been made.

4.06.36 Street Lighting. The developer shall show street light locations on all residential, commercial, and industrial development plats (*see Standard Plans SL-01 to SL-10*).

- 1. Residential street lights shall be placed on alternating sides of the street at a minimum of 175 feet with a maximum of 225 feet staggered design for roads

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having less than 80 feet of right-of-way. On trail and open spaces, all lights shall be spaced at a minimum of 400 feet and design shall be approved by the parks department. Commercial street light shall be placed at 125 feet soldier design maximum for roads having greater than or equal to 80 feet of right-of-way. Additionally, one street light shall be required at each road intersection and at each cul-de-sac. Street lights should be placed at lot line boundaries to avoid unnecessary obstruction along the property frontage. Occasionally, the case may require a street light to be placed at a location other than at the property boundary; for example, this may occur on a lot with an unusually long frontage. The City Engineer may require additional or fewer street lights at his discretion. Additional street lights may be required in locations where safety hazards or special traffic needs exist; examples include locations such as half block intersections, bending roadways, parking lot entrances and exits, busy intersections, bridges and busy private or commercial driveways.

2. All electrical plans must meet National Electrical Code and be stamped by an Electrical Engineer.
3. The developer shall install all infrastructure required to construct the street lights system. The developer shall pay a fee for street lights. This fee is only for the cost of the material of the street light. All other infrastructure needed to power the street lighting system as shown on the development plat shall be the developer's responsibility. Trenching shall be to the depth, width and standards specified by Herriman City.
4. The Developer shall be assessed a street lighting fee which shall be used by Herriman City to purchase the pole, the head, and the base.
5. Herriman City shall purchase the materials with the fee and shall order the street lights after the preconstruction conference and store the material at the City storage location. It is the developer's responsibility to contact the City and pick up the materials for the street lights and install as required by the improvement plans. Components of the street lighting system shall be in compliance with the standards, specifications and styles currently adopted by Herriman City for use in the municipal right-of-way.
6. The objective of street lighting systems in Herriman City is to provide street lighting which is adequate for the safe flow of night time vehicular and pedestrian traffic on dedicated public streets. A level of street lighting shall be provided which contributes to economic growth, a sense of community identity, a reduction in street crime, and a feeling of security among the citizens.
7. Proposed amendments to street lighting policies shall be reviewed by the Herriman City Planning Commission and the City Engineer and agreement reached on their adoption.
8. Residential Street Lights Standards. See *Standard Plans SL-02 & SL-03*.
 - a. All residential street lights shall be wired with minimum 8 gauge copper wire direct burial cable inside a minimum of 1½" schedule 40 PVC conduit 24" deep and run to the closest power source.
 - b. If powers source is across street, direct burial cable shall be installed inside conduit.

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- c. All cable shall be installed from pole to a Carson L 1419-12 or approved equal light duty box located within two (2) feet of nearest power source.
 - d. All boxes shall have wire crimped and heat fused covering with a In-Line Water tight one-pole LEB and LEC Fuseholder on the Hot lead.
 - e. If more than 4 light in series or through a recreational area use commercial street light standards.
9. Commercial Street Lights Standards. See *Standard Plans SL-04, SL-05 & SL-06.*
- a. All commercial lights shall be wired with minimum 6 gauge copper wire direct burial cable inside a minimum of 1½" Schedule 40 PVC conduit 24" deep.
 - b. All commercial street lights systems shall be a four wire 240 Volt 100 amp system with a power meter enclosed Stainless Steel NEMA 4X Strong Box. If sprinkler box is available same box may be used.
 - c. No more than 6 street lights shall be daisy chained together with a 240 Volt 30 amp breaker.
 - d. All splices shall be wire crimped and heat fused with covering and terminated in a junction box Carson L 1419-12 or approved equal.
 - e. Any junction within 150' of any intersection shall be Carson H 1324 or approved equal.
 - f. All junction boxes between street light and system shall use a Multi-Seal RAB 350 Series connector for all hot phases of power.
 - g. All lights installed along right of ways of 106' or large shall be equipped with Pole-Safe Model 4075 or approved equal breakaway support system.
 - h. All poles shall be wired with a 120 volt plug in receptacle.
10. Towne Center Street Lights.
- a. Street Lights in the Towne Center shall conform to *Standard Plans SL-07 & SL-10*, according to their particular use.

4.06.37 **On Site Lighting.** The provisions of this section shall apply to all outdoor artificial illuminating devices, outdoor fixtures, lamps and other devices, permanent or portable, used for illumination or advertisement.

- 1. Such devices shall include, but are not limited to search, spot, or flood lights, and other fixtures to illuminate structures and facilities such as:
 - a. Buildings and structures.
 - b. Recreational areas.
 - c. Parking lots. See *Standard Plans SL-08.*
 - d. Big box parking lot. See *Standard Plan SL-09.*
 - e. Landscape areas.
 - f. Billboards and other signs (advertising or other).
 - g. Lighting for gas station canopies and other similar uses.
 - h. General areas and yards (including security lighting and lighting for the convenience of customers, patrons, visitors, and so forth).

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2. Every outdoor light source shall be so operated that it does not emit a beam or intense glare beyond the property boundary. Such lighting shall be operated in a way that it is directed away from and shielded from any adjacent property and shall not detract from driver visibility on adjacent streets. Compliance is achieved with fixture shielding, directional control designed into the fixture, fixture location, fixture height, fixture aim, or a combination of these factors.
3. All exterior illuminating devices, except those devices exempt from this section, shall be fully or partially shielded as required.
4. Lamp types for outdoor use in commercial areas shall be high pressure sodium, metal halide only. The initial output, as defined by the manufacturer, is the value to be considered. For determining compliance with this ordinance, the light emitted from outdoor light fixtures is to be included in the total output as follows:
 - a. Outdoor light fixtures installed on poles (such as parking lot luminaries) and light fixtures installed on the sides of buildings or other structures, when not shielded from above by the structure itself as defined in paragraphs below, shall be included in the total light output.
 - b. Outdoor light fixtures installed under canopies, building overhangs, or roof eaves where the center of the lamp or luminaire is located at least five feet but less than ten feet from the nearest edge of the canopy or overhang shall be included in the total outdoor light output.
 - c. Outdoor light fixtures located under the canopy and ten or more feet from the nearest edge of a canopy, building overhang, or eave are to be included in the total outdoor light output as though they produced only 1/10th of the lamps initial rated lumen output.
5. Total outdoor light output (excluding streetlights used for illumination of public right-of-way) of any commercial development project in Herriman City shall not exceed 2.5-foot candles with a maximum to minimum ratio of 4 to 1 over the entire project. Commercial projects must utilize semi cutoff with top shields or cutoff type fixtures.
6. The following requirements shall apply to canopies:
7. All luminaries mounted on the under surface of service station canopies shall be fully shielded and utilize flat glass or acrylic covers.
8. The total light output shall not exceed 5 foot-candles averaged under the footprint of said canopy at finished grade. Luminaires mounted on the lower surface of the canopy and auxiliary lighting within signage or panels over the pumps shall be included in the above.
9. The provisions of this section are not intended to prevent the use of any material or method of installation that is not specifically prohibited by this section, if any such alternate has been approved by review of the Herriman City Engineer. The Herriman City Engineer may approve any such alternate as long as the proposed design, material or method provides equivalence to those specific requirements of this section or is otherwise satisfactory and complies with the intent of this section.

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10. All outdoor illuminating devices shall be installed in conformance with the provisions of this section as well as with all other provisions of the Herriman City Zoning Code and the Building Codes, as these are later amended and as applicable.
11. Where exterior lighting is installed on property outside the public right-of-way, lighting shall be so arranged as to reflect the light away from adjoining premises; exterior lighting shall not create a nuisance for adjacent property owners or inhabitants. Furthermore, lighting shall be arranged so as to not create a traffic hazard.
12. Exterior lighting may be provided by a freestanding fixture in the yard space between buildings or structures and the public right-of-way or attached to the wall of a building or structure where the distance from the wall to the public right-of-way is not more than 30 feet.
13. Style of the lighting fixtures and the locations of the fixtures shall be approved by the Herriman City Planning and Zoning Commission.
14. Each off street parking area on residential structures may be illuminated for safety by installing lighting fixtures which emit light at least equivalent to that of one 100-watt incandescent bulb per 100 feet in all directions. All lighting shall be shielded so as not to shine into surrounding residences.

4.07 Storm Drain Design

All storm drain systems shall be designed to the requirements listed below.

- 4.07.01 Storm drain systems shall be designed to handle the governing storm event. Pipe systems shall be designed to convey the 10-year frequency storm. The 100-year storm shall be routed by streets or other facilities in the development. Provide cross section showing proposed grades of adjacent lots, including basements. Detention ponds shall be designed to meter flow out of the development at a maximum rate of 0.2 cfs/ac based on the governing storm event. Temporary retention ponds shall be allowed on a case by case basis, as approved by the City Engineer. Temporary retention ponds, if allowed, shall be designed to hold the 24-hour duration, 100-year frequency storm event. All ponds shall be designed with a minimum of one foot of free board. The precipitation depths for Herriman are in the table below (TRC 1999).

Precipitation Depths		
Time (min.)	10-year (in.)	100-year(in)
15	0.55	0.89
30	0.70	1.24
60	0.88	1.46
360	1.37	1.90
720	1.64	2.32
1440	1.86	2.57

- 4.07.02 Storm drain pipe material shall be class III RCP.

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- 4.07.03 HDPE pipe may be considered in areas outside of the municipal Right-of-Way for sizes 18" and smaller in diameter.
- 4.07.04 Storm Drain manhole spacing shall be 400 feet maximum. Catch basins will be placed every 500 feet on each side of the road. Clean out boxes will be located before storm water is discharged into existing facilities. No storm drains are to be placed in driveways or within the radius of corners at intersections.
- 4.07.05 Pipe size shall be determined by required capacity but in no instance shall the mainline size be less than 18" diameter.
- 4.07.06 Storm Drain manholes shall be 4' diameter for in-line manholes where grade changes occur. 5' diameter manholes are required when deflection angle is greater than or equal to 45 degrees, when the manhole is a junction manhole of three or more lines, for pipe whose inside diameter is 12" or greater, or when the cover above invert elevations is 14 feet or greater. All manholes shall be constructed with steps for maintenance access.
- 4.07.07 Detention facilities are required for all development and shall be sized to detain the additional storm water generated due to development of the property beyond the undeveloped condition. Developer shall comply with local, state and federal requirements for stormwater pollution prevention.
- 4.07.08 Detention basins shall be either on a separate lot which complies with the Herriman City Zoning Ordinance or when approved by the City Engineer within an easement dedicated to Herriman City which is part of a legal lot.
- 4.07.09 Detention facilities shall have a metered outlet flow equivalent to or less than the normal undeveloped flow. An optional method is to assume 0.2 cfs/acre as an outlet flow. The developer shall provide calculations showing which condition governs.
- 4.07.10 Detention basins shall be designed to provide the following:
1. Side slopes of 3:1 maximum. Steep slopes may be approved with engineered decorative retaining structures such as rock wall.
 2. All weather vehicular maintenance access around the entire basin (min 10 foot width).
 3. Heavy Truck (40,000 lbs.) access around the entire basin (min 10 foot width).
 4. Heavy Truck (40,000 lbs.) access to the inlet and outlet structures shall be constructed of asphalt/base or concrete/base.
 5. Lot shall provide normal frontage requirements.
 6. No flag lots shall be used for detention facilities.
 7. Flow through design which eliminates "wet basin" in a detention basin.
 8. Pressurized irrigation system and landscaping shall be compatible with the surrounding area. Irrigation system shall comply with Herriman City's standards.

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9. Cross slope within basin shall provide adequate drainage. Under no circumstances shall the slope be less than 1% across any portion of the basin.
 10. All detention lots or easements shall be properly surveyed and corners permanently marked prior to acceptance of improvements.
 11. If possible, detention basins for multiple areas or phases in a development shall be combined.
 12. The Herriman City Parks Department may require additional grading or different slopes, planting or layout of detention basins to make better use of the space or for more efficient long-term maintenance of the basin.
- 4.07.11 Storm water design and construction methods must adequately address potential problems which may arise during construction or by design so as not to pollute, erode, deposit sediment, or cause any other degradation to existing natural conditions.
- 4.07.12 All storm water installation shall comply with the City's Storm Water Master Plan.
- 4.07.13 Should the installation of a storm water system require easements to Herriman City, the developer of such system shall convey such easements by deed to Herriman City.
- 4.07.14 Clearance between other utilities shall be at least 18 inches. Closer tolerances require reinforcement concrete cradle or other acceptable separation. Reinforcements shall be as per the current specifications.
- 4.07.15 All runoff shall be detained in a public detention facility prior to outlet into any major water course. Private facilities may be allowed only upon approval of the City Engineer. The developments required to provide such facilities include all those with a total land area in excess of 30,000 square feet, plus any others of lesser area which would produce runoff, as determined by the City Engineer, that could cause flooding problems or add to already existing flooding problems.
- 4.07.16 All detention facilities must be designed to safely and reliably accommodate an emergency overflow that safely conveys flood waters to a nearby street or other acceptable facility.
- 4.07.17 The use of pumps to drain detention facilities will not be allowed.
- 4.07.18 Should easements be necessary for the installation and maintenance of public storm drain systems, such easements shall be provided at no cost to the City and shall be a minimum of 20 feet in width with the storm drain line centered within the easement. Larger easements widths may be required depending on pipe size, pipe depth, etc. The easement shall state that no buildings, utilities, or structures shall be erected or constructed within such easements as to interfere with the activities necessary to properly access and maintain or replace such lines or storm drain structure.

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- 4.07.19 All storm drain manholes are required to have legal and physical access. Physical access shall consist of an all-weather surface sufficient to provide for the needs of all routine maintenance and repair equipment.
- 4.07.20 All detention ponds shall be landscaped and irrigated according to Herriman City Standards.
- 4.07.21 All storm drain pipe shall be video taped with a copy submitted to Herriman City. Inspector shall verify video inspections prior to system substantial bond release. Herriman City public works inspector shall be present during video inspection.

4.08 Culinary Water System Design

Culinary water systems shall be designed according to the following requirements listed below, and as shown on *Standard Plans CW-01 to CW-15*.

- 4.08.01 Standard centerline alignment within the public right-of-way shall be 10 foot north or 10 foot west of the centerline.
- 4.08.02 Polyvinyl Chloride Pipe (PVC) C900 or C909 may be used for buried sizes 10 inches and smaller. Ductile iron pipe PC- 350 or CL-52 shall be used for all pipes 12 inches and larger. All fittings and valves 4 inches and larger shall be ductile iron and must meet the requirements of NSF 61 and ANSI/AWWA C-153.
- 4.08.03 All new Ductile Iron pipes shall be wrapped with an 8 mil Poly Wrap to minimize corrosion.
- 4.08.04 Ductile Iron fittings and valves shall be greased and wrapped with an 8 mil Poly Wrap to minimize corrosion using 8 mil poly tape.
- 4.08.05 Valves shall be located in all intersections and shall **equal** the number of legs of the fitting.
- 4.08.06 Fire Hydrant spacing shall not exceed 300 feet in areas of multi-family dwellings, and in commercial and industrial use areas. In widely spaced single family dwelling use areas hydrant spacing shall not exceed 500 feet.
- 4.08.07 Minimum mainline diameter shall be 8 inches. System demand requirements will dictate actual size requirements.
- 4.08.08 Service line shall be constructed of IPS polyethylene pipe. Minimum size shall be 1 inch diameter for residential connections. Location of water service shall generally be located 10 to 15 feet from either property line of the lot served. No meter box shall be allowed in any driveway, driveway flare, or sidewalk. Location of service line shall be clearly marked into the face of the adjacent curb. Location of extended

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service lateral towards building shall be located via a 2 x 4 with a blue colored end visibly extended above adjacent surface. Locator wire shall be run with each service.

- 4.08.09 Minimum cover required shall be 48 inches. Minimum cover on transmission lines shall be 60 inches.
- 4.08.10 Minimum pressure allowed to each individual service shall not drop below 40 PSI under peak day demands.
- 4.08.11 Should the installation of a water system require easements to Herriman City, the developer of such system shall convey such easements by deed to Herriman City.
- 4.08.12 All other utilities crossing the water main shall do so at as close to a right angle as possible.
- 4.08.13 Perpendicular or skewed crossings between other utilities and water mains shall have clearance of at least 24 inches. Closer tolerances require a steel casing in combinations with no mechanical joints of either utility within 10 feet horizontally of the crossing or additional separation. Reinforcement shall be as per the current specifications.
- 4.08.14 Cover over utilities and between railroad tracks or roadways shall be sufficient to adequately protect such utilities from potential loading of track or roadway either during construction or final finished surface. Should cover be insufficient to adequately protect utility, encasement or casings shall be provided to protect affected utility. All casing shall be twice the size of the pipe with thinsulators installed per manufactures guidelines.
- 4.08.15 Should easements be necessary for the installation and maintenance of public culinary water systems such easements shall be a minimum of 20 feet in width with the water line centered within the easement. No buildings, utilities, or structures shall be erected or constructed within such easements as to interfere with the activities necessary to properly access and maintain or replace such lines or water structures.
- 4.08.16 Appropriate backflow prevention devices shall be installed on service laterals to protect the municipal water system from low level (non-health) and/or high level (health) contamination through cross connections. Specifically, the laws, regulations and conditions set forth in Federal Public Law 99-339, Utah Code Section 19-4-112, Utah Public Drinking Water Rules Section R309-102-5, Occupation Safety and Health Rules and Regulations Part 1910-Subpart J Section 1910.41 and the current International Plumbing Code shall be adhered to for the cross connection control program of each consumer of the municipal water system. All backflow prevention assemblies shall be in-line serviceable, in-line testable and have certification through third party certifying agencies. See the Herriman City cross connection control ordinance for additional details.

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- 4.08.17 All pressure reducing stations shall be underground packaged stations factory built, factory delivered, with all necessary internal piping, valves and other necessary appurtenances as shown in the Herriman City pressure reducing stations detail. The underground pressure reducing station shall be complete when delivered and will not require internal contractor construction except to install the power service through the service conduit provided for that purpose. The underground pressure reducing station shall be manufactured by Engineered Fluid, Inc. (EFI), or approved equal. Herriman City has predetermined the make and model of each internal component which shall be included in the pressure reducing station. The size of the pressure reducing station shall be determined by the size of the water lines connecting to the station and flow demands of those lines, which will be determined by Herriman City.
- 4.08.18 All PRV's shall be epoxy coated inside and out, including all internal parts.
- 4.08.19 All developers are required to install a sampling station for every 80 lots or one per development for developments smaller than 80 lots.
- 4.08.20 Where dead end mains occur, they shall be provided with a fire hydrant if flow and pressure are sufficient or with an approved flushing hydrant or blow-off for flushing purposes. Flushing devices shall be sized to provide flows of which will give a velocity of at least 2.5 feet-per-second in the water main being flushed. No flushing device shall be directly connected to any sewer.
- 4.08.21 All blow offs and flushing hydrants shall be pre-manufactured.
- 4.08.22 Valves: All Valves 8 inches and smaller shall be gate valves, valves 10 inches and larger shall be butterfly valves. All valves 4 inches and larger shall be ductile iron and must meet the requirements of NSF 61 and ANSI/AWWA C-153.
1. Valves shall be spaced no further than 1000' or split the difference.
 2. All control valves shall be CLA-VAL brand valves.
 3. All butterfly valves shall be rated for 250 psi.
- 4.08.23 All Tapping sleeves shall be stainless steel Smith-Blair 664 or JCM432 tapping sleeves.
- 4.08.24 All valves for fire hydrants shall be located in the street flanged off of the tee.
- 4.08.25 All water lines shall have a 3" magnetic warning tape installed in the trench approximately 12" above the pipe.
- 4.08.26 All Fittings shall be MJ MEGALUG.
- 4.08.27 All concrete vaults shall be constructed as per APWA Plan No. 505 with the following additions.

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1. Victaulic couplings shall be used on all piping between isolation gate valves for case of maintenance; placement shall be approved by the City Engineer.
2. All vaults shall be equipped with two 120 VAC commercial grade receptacles with water tight covers, a 100 watt incandescent vapor tight light fixture with protective cage, a fractional HP hermetically sealed exhaust fan sized to remove total air volume 30 times per hour, and all conduit shall be rigid galvanized steel. The fan and light switches shall be located within arm's reach of the entrance. A 100 Amp service panel shall be provided.
3. All vaults shall be equipped with intake and exhaust vents. The vents shall be located at opposite ends of the vault with the intake terminating 12 inches from the floor and the exhaust terminating a minimum of 4 feet from the floor.
4. All isolation valves located inside vaults shall be hand operated with a wheel. Valve box shall not be poured in the lid as shown as APWA Plan 523,525,527, and 529.
5. All water meter vaults shall be equipped with an additional 15" removable water meter lid with a 2" knockout. The 15" lid shall be poured in the vault lid and set at the finished grade. The 15" lid will be used with the radio read meters.
6. All water meter vaults larger than 3" shall be designed and submitted to Herriman City for review. General vault requirements are established by these standards and the APWA Manual. It is recommended that preliminary discussions take place with the City Engineer prior to design.
7. All 1½" and 2" meter vaults shall be 5' x 5' x 5'-6" and shall have a 30" ring and lid, 15" ring and lid and stairs.
8. All pipe and valves need to be epoxy painted inside and outside within the PRV vault.

4.08.28 Any water facility that has walk-in doors shall be equipped with Primas locks with approval from Herriman City Municipal Water Department.

4.09 Secondary Water System

This section provides general guidance for the City's secondary water system. Items may be added, replaced or eliminated as deemed necessary by the City. Additional information may also be required. Secondary water systems shall be designed according to the following requirements and as shown on *Standard Plans SW-01 to SW-04*.

4.09.01 **Policies.** The distribution system shall be designed to maintain a minimum of 40 psi at all points of connection, under all conditions of flow, but especially during peak instantaneous flow conditions.

1. There shall be no physical connections, public or private, which would result in cross connections to any potable water main from secondary water mains.
2. No connections shall be made to any sewer, storm drain, or appurtenances thereto, which could permit the passage of any wastewater or polluted water into the secondary supply.

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4.09.02 Secondary Water Design

1. **Minimum Line Size.** The minimum line size serving cul-de-sacs or linear looped streets shall be 4 inch, when serving less than eight lots. The minimum line size serving cul-de-sacs or linear looped streets shall be 6 inch, when not more than 12 homes/units are connected to the main. The minimum line size in all other conditions shall be 8 inch. Actual flows must be modeled to ensure that minimum sizes are adequate for normal flow requirements as well as when some looping lines are out of service. Sizes are subject to engineering review.
2. **Water Line Placement.** All secondary water distribution mains within residential subdivisions shall be placed in roadway 2' off lip of curb. *See Standard Plan SW-01.*
 - a. Secondary water mains shall be laid at least ten feet horizontally from any existing or proposed sewer line.
 - b. Secondary water mains shall not be installed at side or rear property lines. All lines will be installed within a Public Right of Way.
 - c. **Magnetic Locator Wire Required.** All pipes shall include a 3-inch wide magnetic locator tape installed in the pipeline trench approximately 12 inches above the pipe.
 - d. Service laterals shall typically be run one for every two lots, and shall be 1 ½ inch diameter ips polyethylene pipe. Where single service lines run under the street (long side), the services shall be 1 ½ inch diameter ips polyethylene pipe. Short side services shall be 1" diameter ips polyethylene pipe.
3. **Cover Requirements.** All water lines and appurtenances shall have a minimum cover of 36 inches.
4. **Pipe Material.** Polyvinyl Chloride Pipe (PVC) C900 may be used for buried sizes 8 inches and smaller. Ductile iron pipe PC – 350 or CL-52 shall be used for all pipe 10 inches and larger. All fittings and valves 4 inches and larger shall be ductile iron and must meet the requirements of NSF 61 and ANSI/AWWA C-153. All PVC pipe shall be Purple and all ductile iron shall have AWWA C105 purple polyethylene wrap.
5. Slope water pipe and position drains at low points.
6. Locate air release stations at the end of cul-de-sacs, on all dead end pipes, high points within the system and as directed by the City Engineer.
7. Connection to existing pipe line shall be made as such times and within the time limits as directed by the city.

4.09.03 **Valves.** Manufacturer's name and pressure rating marked on valve body. Valves 8 inches and smaller shall be gate valves, valves 10 inches and larger shall be butterfly valves.

1. **Gate Valves Up To 3 Inches.**

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- a. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, IPS ends, and hand wheel.
 - b. Product: Powell U.S. Bronze Gate Valves or accepted equal.
 - c. Substitutions: See Section 01 25 00 – Product Options and Substitutions
2. Gate Valves 3 Inches and Over
- a. AWWA C500, iron body, bronze trim, non-rising stem with square nut, single wedge, mechanical joint or flanged ends as indicated, and cast iron valve box.
 - b. AWWA C509, iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, mechanical joint or flanged ends as indicated, and cast iron valve box.
 - c. Product: Mueller Gate Valve or Resilient Seat Gate Valve with appropriate type Tyler 564A Cast Iron Valve Box, or accepted equal
3. Ball Valves Up To 2 Inches.
- a. PVC body, PTFE seat seal, PVC ball and ABS handle.
 - b. Product: To be approved by Herriman City.
4. Swing Check Valves from 2 inches to 24 inches.
- a. AWWA C508, iron body, bronze trim, 45 degree swing disc, renewable disc and seat, flanged ends.
 - b. Product: Mueller Swing-Type Check Valve, or accepted equal.
5. Butterfly Valves from 2 Inches to 24 Inches.
- a. AWWA C504, iron body, bronze disc, resilient replacement seat, mechanical joint or flanged ends as indicated, manual worm gear operator, and cast iron valve ox where required.
 - b. Underground manual operators shall be totally enclosed, factory grease packed and sealed, bronze worm gear operators with self-locking gearing; stops shall be provided to prevent over travel of valve disc.
 - c. Valve operator shall be geared to close valves slowly. Number of turns to close valve from full open position shall be: 32 for 10-inch and smaller valves, 52 for 12-inch thru 16 inch valves, and 76 for 18-inch through 24-inch valves. Closing times for larger valves shall be accepted by the Engineer.
 - d. Product: Mueller "Linesal III" Butterfly Valve with appropriate type Tyler 564A Cast Iron Valve Box, or accepted equal.
6. Corporation Stops. Shall be type for connecting to copper or polyethylene pipe; Mueller No. H-15000, or accepted equal, for up to 2-inch service line.
7. Air Release Valves. Shall be combination air release valves; APCO Combination Air Release Valves, or acceptable equal, of size indicated on the drawings.
8. Stop & Waste. Mueller-MUH 10288-010 or Ford b11-4445 SWM. (See *Standard Drawing SW-01*).
9. Valve Box lid shall be triangular and marked irrigation.
- a. Product: Olympic VBU-8500 D&L M-9009

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4.09.04 Location of Isolation Valves.

1. Placed at the entrance to a cul-de-sac.
2. Placed at intervals not to exceed 800 feet in residential areas and 500 feet in commercial areas.
3. Placed at intersections on all branches of the system.
4. Placed within 10 feet of the upstream and downstream ends of an augured or trenched casing.
5. If valves are located in an undeveloped area, a vertical valve marker will be required.
6. Valves shall be placed in clusters where possible, and at property lines and point of curves.
7. Fittings to be MJ MEGALUG.

4.09.05 Accessories.

1. Service Clamps: shall be bronze, double-strap type; Mueller No. H-16000, or acceptable equal, for up to 2-inch service lines.
2. Meter Nut: All brass conforms to AWWA standard C800 and shall be able to connect directly to the PVC ball valve and the Neptune T-10 positive displacement meter. Product: Straight Meter Coupling.

4.09.06 Preparation.

1. Cut pipe ends square, ream pipe ends to full pipe diameter, remove burrs.
2. Remove scale and dirt on inside and outside before assembly.
3. Prepare pipe connections to equipment with flanges or mechanical joints.

4.09.07 **Service Connections.** Service lines shall be installed at uniform grades and alignments; and shall be free of low spots or adverse grades. Service lines shall be cleaned, flushed and tested in accordance with applicable requirements of these specifications.

4.09.08 **Field Quality Control.** Refer to Herriman City's Development Standards Section 33 08 00 Commissioning of Water Utilities (located in *Section 5*).

4.10 Surveying/Staking

4.10.01 All survey and staking within a development shall be conducted according to the following requirements.

4.10.02 All surveying, both horizontal and vertical, shall be tied to two Herriman City Monumentation, using State Plane Coordinates, Utah Central Zone, NAD 83 US Survey foot.

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- 4.10.03 Stakes set for the construction of inlet boxes, manholes or other structure shall include a minimum of at least two stakes to adequately locate and align structure.
- 4.10.04 Back lot corners shall be marked with a metal pipe or rod driven into the ground, and projected front lot corners shall be identified with permanent brass markers in the sidewalk or back of the curb. The brass markers shall be a minimum diameter of 1.17 inches. The appropriate lot number shall be stamped into the marker divided by a vertical line centered on the property line, example H23|H24. The markers shall be countersunk into the concrete.
- 4.10.05 All lot corners must be in place prior to the issuance of building permits and after the completion of all development improvements.
- 4.10.06 It shall be the responsibility of the lot owner to ensure that all lot corners are in place prior to the final inspection. The City is not responsible to replace survey stakes or markers.
- 4.10.07 Care must be taken to not disturb, remove, or alter any existing monumentation found, recorded, or otherwise encountered during the development of property.
- 4.10.08 New monumentation is required in all new developments and shall include all intersections, PI's and/or PC's, PT's. All monuments shall be Salt Lake County monuments, see Salt Lake County for current requirements.
- 4.10.09 Monumentation of all water services, sewer services, gas services, and power services shall be marked with brass markers of a minimum diameter of 1.17 inches. The markers shall be located in the top back of curb. The appropriate utility shall be stamped on the marker (WATER, SEWER, GAS, and POWER).
- 4.10.10 All monumentation installed for the subdivision, removed or disturbed during construction shall be at the expense of the developer.

4.11 Vinyl Fence Specification (Privacy and 4-rail fencing)

The following requirements are the general specifications for vinyl fencing.

- 4.11.01 General requirements for materials, workmanship and installation of rigid polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) compound privacy fencing within the municipal right-of-way are as follows:
 - 1. Vinyl fence shall be either four (4) rails (5'), solid privacy (6') or semi private (6').
 - 2. All vinyl products shall meet or exceed minimum standards and tolerances set forth by ASTM for length, nominal thickness, heat shrinkage, weathering, color, chalking, profile, impact resistance, warp or bow, etc. Specifically refer to ASTM D 1784-99a, 'Standard Specification for Rigid Poly Vinyl Chloride

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(PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds'

3. All vinyl components shall be covered by a non-prorated limited lifetime manufacturer warranty.
4. All hardware and fasteners shall be galvanized or stainless steel. Manufacturer produced hardware and fasteners shall be used where possible.
5. All fencing shall be installed by mechanics skilled and experienced in erecting fences of the particular type to be installed and shall be in accordance with Herriman City specifications.
6. All installed vinyl fencing shall be designed and constructed to withstand 90 mph wind loads as determined by the Uniform Building Code.
7. Color and style of the fencing shall be as dictated by the Herriman City Planning Commission or other designated authority. Alignment of the installed fence and fence components, both plan and profile, shall be in straight lines so far as conditions of the site permit.
8. The installer shall leave the fence construction area free from excess dirt, rubble, concrete, scraps, debris, packaging or other waste directly resulting from the fence construction activities.
9. Where recommendations of the manufacturer are more stringent or conservative than Herriman City specifications, the recommendations of the manufacturer shall be followed.
10. The fence shall be placed in the alignment specified in the development plat and/or plans.

4.11.02 Specific requirements for materials, workmanship and installation of vinyl fence posts are as follows:

1. Post dimensions shall be 5.0 inches square (outside dimension) with minimum wall thickness of 0.17 inches (heavy wall). Posts may have pre-formed holes for rails.
2. Post spacing shall be no greater than 6.0 feet on center.
3. Post holes shall be a minimum 12.0 inches diameter by 36.0 inches depth. In all cases, the embedment depth of the posts shall be minimum 36.0 inches below finished grade. Posts shall be aligned and plumbed and post holes shall be filled with concrete to within 3.0 inches of finished grade. Concrete post mix shall be allowed to cure a minimum of one week before rails and slats are installed.
4. All posts shall be reinforced with #4 bar and concrete or steel sleeves. Where #4 bar and concrete is used, place two #4 bars at diagonal corners of the post and fill the post with concrete from the bottom of the post to a level 24.0 inches above the finished ground surface. All gate posts and end posts shall be reinforced with #4 bars and concrete to a level the full height of the post. Where steel sleeves are used, the sleeves shall of a type recommended by the manufacturer and shall extend the full height of the post.

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5. All concrete used for reinforcing and setting fence posts shall be Class 3000 by APWA standards and specifications. All concrete shall be pre-mixed and wet-set.
6. Vinyl caps of the style designated by the Herriman City Planning Commission or other designated authority shall be installed on all fence posts. Fasten post caps on every post according to manufacturer recommendations.

4.11.03 Specific requirements for materials, workmanship and installation of vinyl fence rails are as follows:

1. Rail dimensions shall be 1.5 inches by 5.5 inches ribbed with a minimum wall thickness of 0.09 inches. Wherever possible, rails shall span two post spacing (12 feet). Rail joints in adjacent vertical rail levels shall be staggered horizontally in the fence posts.
2. The bottom rail of a standard vinyl privacy fence should be located approximately 2.0 inches above the finished grade elevation. The bottom rail of a standard vinyl 4 rail fence should be located approximately 9.0 inches above the finished grade elevation. Adjacent vertical rails of standard vinyl 4 rail fences should be placed approximately 9.0 inches between.
3. Top and bottom rails of standard vinyl privacy fence shall be reinforced with galvanized, stainless steel or other corrosion resistant metal per manufacturer recommendations.
4. Fasten all rails according to manufacturer specifications.

4.11.04 Specific requirements for materials, workmanship and installation of vinyl privacy fence slats are as follows:

1. Slat dimensions shall be 6.0 inches by 0.875 inches ribbed with a minimum wall thickness of 0.06 inches.
2. All slats shall be "tongue and groove" style.
3. Fasten slats according to manufacturer specifications.

4.11.05 Specific requirements for materials, workmanship and installation of vinyl gates are as follows:

1. Gate style should match the fencing style.
2. Vinyl gates shall be installed according to manufacturer recommendations using all necessary hardware to make them self closing and self latching.
3. Gates less than or equal to 4 feet in width may be all vinyl construction and shall be purchased pre-assembled from the fencing manufacturer where available. Where special gate widths are necessary due to site constraints, gates smaller than 4 feet in width shall be assembled using gate kits or instructions provided by the manufacturer. Two standard 4 foot gates may be used to create an opening up to 8 feet wide.
4. Vinyl gates wider than 4 feet shall be reinforced with a suitable material and configuration or otherwise constructed to enable them to span the desired

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distance without sagging or ceasing to swing properly or otherwise become structurally or functionally unsound. In most instances, a steel or aluminum frame with a vinyl gate façade or a steel or aluminum gate powder coated to match the vinyl fence color is preferable. Consult the manufacturer for recommendation on construction of gates wider than 4 feet.

4.12 Precast Concrete Fence Specifications

The following requirements are the general specifications for precast concrete fencing.

4.12.01 General requirements for materials, workmanship and installation of concrete fencing, including panels, posts, footings, site work and other appurtenances, within the municipal right-of-way are as follows:

1. All concrete products shall meet or exceed applicable minimum standards and tolerances set forth by ASTM for strength, hardness, deformation, durability, etc. Similarly, other products, such as curing compounds, stains, reinforcement, fasteners, grout, hardware, etc., used in the manufacturing, production, construction and/or installation of concrete fences shall meet or exceed applicable minimum standards and tolerances set forth by ASTM.
2. The work shall be performed in accordance with all applicable federal, state and local safety laws and regulations, including the Occupational Health and Safety Act of 1970 as amended (OSHA). Responsibility for awareness and observation of any recommended practices or regulations concerning the handling, placement, or installation of construction materials shall be that of the Developer.
3. If requested by the City, the Developer shall provide drawings and details stamped by an engineer licensed in the State of Utah which adequately describe the precast fencing elements including:
 - a. shape and dimension of precast components,
 - b. size, quantity and details of the reinforcing steel,
 - c. quantity, size and type of connection hardware,
 - d. size and location of drain openings, and
 - e. size, type and details of necessary lifting mechanisms.
4. If requested by the City, the Developer shall provide design calculations stamped by an engineer licensed in the State of Utah which include a summary of all design parameters including material types, strength values, allowable stresses, assumed loads, load combinations, etc.
5. If requested by the City, the Developer shall provide a copy of a soils report prepared by an engineer licensed in the State of Utah for the project.
6. APWA Section 03 40 00 Precast Concrete shall apply, where applicable, to Work provided under this section.
7. Where recommendations of the manufacturer or design engineer are more stringent or conservative than Herriman City specifications, the more conservative specifications shall be followed.

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8. All installed concrete fencing shall be designed and constructed to withstand 90 mph wind loads as designated by the Uniform Building Code.
9. Color and style of the concrete fence shall be as dictated by the Herriman City Planning Commission or other designated authority.
10. The fence shall be constructed in the alignment specified in the development plat and/or plans.
11. Alignment of the installed fence and fence components, both plan and profile, shall be in straight lines so far as conditions of the site permit. Posts and panels shall be installed plumb.
12. All fencing shall be installed by mechanics skilled and experienced in erecting fences of the particular type to be installed and shall be in accordance with Herriman City specifications.
13. The Developer shall leave the fence construction area free from excess dirt, rubble, concrete, scraps, debris, packaging or other waste directly or indirectly resulting from the fence construction activities.
14. Herriman City reserves the right to require the Developer, at the Developer's expense, to perform all tests necessary to ensure that the materials used in the fence or its installation conform to the standards and specifications given in this manual.

4.12.02 Specific requirements for materials, workmanship and installation of precast concrete fence posts and post caps are as follows:

1. Post centers shall be spaced 12.0 feet apart.
2. Post dimensions shall be 6.0 feet high by 20.0 inches square (outside dimension) and shall have a hollow center to facilitate attaching the post to the footings by a dowel and grout connection.
3. Posts shall be reinforced with one vertical #5 bar in each corner of the post and six #3 horizontal tie bars spaced evenly (12.0 inches on center) up the vertical height of the post. Reinforcement shall conform to specifications given in APWA Section 03 20 00. Ensure that 1¼" inches of cover is maintained at all points on the post.
4. Glass fiber may be used as secondary reinforcement in all concrete components of the fence. Fiber reinforcement shall conform to the specifications given in APWA Section 03 20 00.
5. All concrete used for posts shall be Class 4000 per APWA Section 03 30 04 standards and specifications.
6. The method of post attachment to the concrete footing shall be by embedding two #4 dowels placed near the center of the footing which extend from at least 1.0 foot down into the footing to at least 3.0 feet up into the hollow center of the post. The hollow center of the post shall then be grouted full to secure the bond between the footing and the post. Other mechanical means of attachment, when accompanied by engineering calculations and drawings demonstrating the structural integrity of the connection under applicable design loads, may be used.
7. Posts shall have the same finish and texture on all exposed sides.

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4.12.03 Specific requirements for materials, workmanship and installation of precast concrete fence panels and panel caps are as follows:

1. Panels shall be 6.0 feet high. The thickness of the panel shall be no less than 4.0 inches. The length of the panels shall be such that the panels can be placed between and connected mechanically to the posts which are spaced on 12.0 foot centers.
2. Where used, panel caps shall have typical dimensions of 8.0 inches wide with a minimum thickness of 3.0 inches. The length of the panel cap shall be appropriate to cover the length of the panel.
3. Panels shall be reinforced with #3 bars placed 12.0 inches on center each way to within 1.5 inches from the panel edges. Equivalent welded steel wire fabric at the front and back of the panel may be substituted for the #3 bar configuration. Either type of reinforcement shall conform to the specifications set forth in APWA Section 03 20 00. Ensure that 1½" inches of cover is maintained.
4. Panel caps shall be reinforced by two #4 bars spaced 2½" inches on either side of the centerline of the cap. Reinforcement shall conform to specifications given in APWA Section 03 20 00. Ensure that 1½" inches of cover is maintained.
5. Glass fiber may be used as secondary reinforcement in all concrete components of the fence. Fiber reinforcement shall conform to the specifications given in APWA Section 03 20 00.
6. All concrete used for panels and caps shall be Class 4000 per APWA Section 03 30 04 standards and specifications.
7. Panels shall have the same finish and texture on both sides.
8. The gap between the bottom edge of the lower panel and top of finish grade shall be 2.0 inches minimum and 4.0 inches maximum.

4.12.04 Specific requirements for materials, workmanship and installation of footings for precast concrete fence are as follows:

1. Footing centers shall be spaced 12.0 feet apart.
2. Footings shall be a minimum 24.0 inches square by 42.0 inches deep. In all cases, the embedment depth of the footing shall be minimum 42.0 inches below finished grade.
3. Reinforcement in the footings shall be by one vertical #5 bar in each corner of the footing with five #3 horizontal tie bars spaced 6.0 inches on center from the top of the footing and one #3 horizontal tie bar placed 4.0 inches from the bottom of the footing. Additional reinforcement may be required as specified by the manufacturer's design calculations. Ensure that 3.0 inches of cover is maintained.

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4. All concrete used for footings shall be Class 3000 per APWA Section 03 30 04 standards and specifications. All concrete for footings shall be pre-mixed and wet-set.
5. Where a precast concrete fence post shares the same footing as a gate post of some other material, the size of the footing shall be increased to accommodate both posts.
6. Freshly poured concrete shall be tamped with a steel rod or vibrated with a mechanical vibrator until the concrete is thoroughly consolidated and without void.
7. Excavations for footings shall be to undisturbed soil or to the depth noted on the engineered drawings. Leave the bottom bearing surface clean and smooth. If footing excavations are made deeper than intended, concrete shall be used for fill.

4.13 Landscape Design

All irrigation work shall be inspected and approved by the parks division. Prior to beginning any landscaping work in this section, approval shall be obtained by the developer and/or contractor in writing from the parks division.

4.13.01 **Coverage Test.** Proper irrigation of the landscape should be performed prior to placement of sod, seeding or hydro seeding to bring up moisture content.

4.13.02 **Scope of Work.** The work consists of furnishing all equipment, labor and materials necessary for the planting of areas indicated on the plans. Plant totals on the plant list shall be consistent with the illustrated quantities on the plans. The Parks Division shall approve all sizes and quantities.

4.13.03 Drawings and Specifications.

1. **Ordinances and Regulations.** All local, Municipal and State laws and rules and regulations governing or relating to any portion of this work are to be incorporated into and made a part of all plans and specifications and their provisions shall be carried out by the Landscape Architect and Contractors. Anything contained in these specifications shall not be construed to conflict with any of the ordinances and regulations of the City; however, these specifications take precedence over the requirement of said rules and regulations when they describe materials, workmanship or construction of a higher standard or larger size.
2. **Bonding and Inspection.** The sprinkler system and landscape planting will be bonded as part of the entire development project. Bond releases will be handled through the Engineering Division. The City will sign off release(s) in the above areas only for 50% and or 75% bond release.
3. **Materials.** Whenever any material is specified by name and/or number, such specifications shall be deemed to be used for the purpose of facilitation of a

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description of the materials and establishing quality. **No substitution will be permitted unless approved by the Parks Department.**

4. In the event of any changes in plant locations or variety, the contractor shall clearly notify the Parks Division. The changes shall be indicated by the signature of the Contractor and an authorized City Official on all sets of plans.

4.13.04 Obstructions Below Ground. Blue Stakes 801-208-2100

1. Prior to excavation for planting or the placing of stakes, the contractor shall locate all electrical cables, conduits and other utilities so that proper precautions may be taken. In the event of a conflict between utilities and plant locations, promptly notify the Parks Division. Failure to follow this procedure places the responsibility and expense upon the contractor for making any and all repairs.
2. Remove rock, road base, or other underground obstructions, except utility lines, to a minimum of a one foot depth to permit proper installation of lawns and planting.

4.13.05 Spacing. When plant material is organized in rows, all plants shall be equally spaced. Where plants are placed in a meandering fashion, unequal spacing is required. Ground cover will be planted at the spacing indicated for each individual plant (a maximum distance of 8" on center).

1. **Plants To Be Furnished.** The Developer shall furnish plants as listed on the drawings and specified in this book. Street tree species shall be mixed to allow biological diversity to prevent possible spread of disease or infestation among like species. All quantities and sizes shall be as follows:
 - a. All shrubs shall be a minimum 5-gallon size unless prior approval is obtained from the Parks Division. Before any approval will be given, the variety, size and spacing must be given in writing.
 - b. All trees shall be a minimum of 2" caliper, measured at 6 inches above the root ball. Any variation requires written approval from the Parks Division. The location of all trees shall be approved by the Parks Division prior to installation.
 - c. The developer shall pay the cost of installation of parkway trees. Parkway trees shall be installed on all designated streets.
 - d. All plants delivered to the site must be first class representatives of their species or varieties. They must be free from disfiguration, with well-developed branch systems and vigorous, fibrous root systems. Plants not conforming to these requirements must be removed, whether in place or not, and replaced with acceptable plant material.
 - e. All plant material must meet the specifications of Federal, State and County laws requiring inspection for plant disease and insect infestation. Tag all plants with the name and the size of the plants in accordance with Standard of Practice recommended by the American

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Association of Nurserymen. Final determination of plant species or variety will be made by the Parks Division.

- f. Root conditions of plants furnished in containers may be determined by the Parks Division. The selection of plants shall be made by the Landscape Architect with the final approval by the Parks Division. Any plant deemed unsuitable will not be accepted by the City and must be replaced at the Contractor's expense.

4.13.06 Substitutions. No substitutions for the indicated plant materials will be permitted unless approved in advance by the Parks Division. Any substitutions shall be at least the same quality and size as to that specified on the plans. All substitute plant materials shall conform to the requirements of these specifications.

4.13.07 Finish Grading and Soil Preparation. Finish grading shall consist of the following:

1. Planting areas shall conform to the uniform grade by floating or hand raking, with soil containing 1" minus rock.
2. It shall be the responsibility of the landscape contractor to ensure proper drainage. Grading shall facilitate the natural runoff of water. Low spots and pockets must be graded to drain properly.
3. Finish grade of all lawn areas shall be flush with adjacent hard surfaces. To ensure proper final grading, adjust soil grade for planting. This may require allowance for differing sod thickness, etc. Roll all lawn areas with a water-filled roller to obtain uniform compaction and level surfaces (50 pounds minimum weight). Slope of grade must have a 1% fall from a structure.
4. Minimum soil preparation shall consist of the following:
 - a. Soil amendment shall be an organic wood base product, 70% from 0 to 1/8".
 - b. Upon completion of grading, soil shall be roto-tilled to a depth of 6", removing all rocks and debris (if soil condition requires it, the City may require import of up to 6" of screened sandy loam topsoil). Soil shall be prepared with the following, mixed thoroughly in all planting areas:
 - i. Three (3) cubic yards per 1,000 square feet of organic wood base product.
 - ii. Five (5) pounds per 1,000 square feet of 16-16-8 fertilizer with 2% iron.

4.13.08 Chemical Weed Control. Pre-emergent chemical of Treflan, Surflan, Enide or other approved product shall be applied at manufacturer's recommended rates and only as directed by the Parks Department.

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4.13.09 **Planting.**

1. Prepare lawn areas as specified under soil preparation. Slope all areas to drain according to the Architect's drawings and Planning Department's and Parks Department's approval.
2. Rake these areas as specified under soil preparation, until the surface areas are smooth and of uniformly fine texture immediately prior to planting the turf, remove all rock from area.
3. Seeding. After areas have been approved for seeding, sow seed mixture at the rate of 10 pounds per 1,000 square feet of area. Seeding shall be done by hydro-mulching process, including Agriform fertilizer or equivalent at the rate of 1 pound actual nitrogen per 1,000 square feet and 1,500 pounds cellulose fiber (dyed green) per acre.
4. Seed mixtures shall be approved by the Parks Department. Seed shall bear this season's certification of weight, purity and germination from a reputable seed company.
5. Watering. After hydro-mulching, thoroughly water seeded areas with a fine spray. Red-seeded lawns and turf areas that do not show prompt germination at ten (10) day intervals until an acceptable stand of grass is assured.
6. Fertilizer. Two weeks after germination, commercial fertilizer (16-16-8) shall be applied at the rate of four (4) pounds per 1,000 square feet.

4.13.10 **Sod.** Prepare lawn areas as specified under soil preparation. Slope all areas to drain according to the Architect's drawings that have been approved by the Planning Division and Parks Division.

1. Immediately prior to planting the turf, rake the lawn areas as specified under soil preparation until the surfaces are smooth and of uniformly fine texture, remove all rock from area.
2. Finish grade of all sod areas will be such that after the sod is installed, the finish grade will level with the sidewalk or adjacent pavement areas.
3. Lay sod with staggered seams. Sod shall be kept moist during installation.
4. After sod has been laid, water the soil, then roll sod with a water roller filled with 50 pound minimum weight to level sod and ensure positive contact with soil. Begin required irrigation immediately following rolling.

4.13.11 **Ground Cover.** Prepare ground cover areas as specified under soil preparation; including commercial fertilizer 6/10 lb of active ingredient with micronutrients, 100% slow release nitrogen. (14-14-14) at the rate of 4 pounds per 1,000 square feet, not less than 1 day prior to planting.

1. Spacing of ground cover shall be no greater than 8" on center.

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4.13.12 Trees and Shrubs.

1. Plant to their normal depth and water in thoroughly. Prepare planting holes and stake the trees as shown in the LP-01.
2. The spacing and species of trees shall conform to the Streetscapes/Park Master Plan ordinance.
3. Location. Trees shall be kept not less than:
 - a. Thirty (30) feet back of beginning of curb returns at any street intersection.
 - b. Twenty (20) feet from lamp standards and power poles.
 - c. Ten (10) feet from fire hydrants.
 - d. Five (5) feet from service walks and driveways.
 - e. Five (5) feet from water meters.
 - f. When planting trees next to school signals use the current *Manual on Uniform Traffic Control Devices*, Section 7D-13, Table VII-1. The table is as follows:

Table VII-1	
85 Percentile Speed (mph)	Minimum Visibility Distance (ft)
20	175
25	215
30	270
35	325
40	390
45	460
50	540
55	625
60	715

- g. All containers, etc., shall be removed from trees and shrubs prior to planting. All B & B stock shall have the baling twine removed and burlap folded down below ground level. Care must be given to not disturb the root zone.
- h. Any trees or shrubs planted too deep will not be accepted. Root flare should be at finish grade (*See Standard Plan LP-01 and LP-02*).
- i. Tree guards are required at the base of the trunk on all trees planted.
- j. All trees installed in turf areas must have a three foot diameter tree well with two inches of decorative bark.

4.13.13 Weed Barrier. A commercial strength weed barrier fabric must be installed in all landscaped areas without sod. Examples of weeds requiring weed barriers are: under mulch, wood chips, around trees in tree grates, etc. Exceptions must be approved in writing by the City.

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4.13.14 **Staking.** Staking shall only be performed if necessary: top heavy, tipping out, etc. (See *Standard Plan LP-01 and LP-02*).

4.13.15 **Tree Grates.** Where tree grates are required:

1. The tree grate must be iron or ductile iron.
2. The tree grate must be a 5' square and not penetrate the sidewalk or curb.
3. The openings between bars must be 3/8" or less for pedestrian safety.
4. The opening provided for the tree must be between 12" and 16" in diameter.
5. To accommodate tree growth, openings must be easily expandable without losing their structural integrity.
6. Tree grates must be painted a flat black with a commercial grade coating.
7. A commercial strength weed barrier fabric must be installed underneath the tree grate. When installing fabric, leave a 12" diameter hole for the tree.

4.13.16 **Maintenance.** Plant maintenance work shall consist of watering, weeding, caring for plants, edging and mowing the lawn, fertilizing, and performing the following plant establishment work:

1. The entire project shall be satisfactorily maintained throughout the twelve month warranty period. The maintenance period will begin after written approval of the Parks Division.
2. The lawn and turf shall be completely irrigated until the Parks Division has given approval of the project to the City Engineer and the Developer. Irrigation shall be applied to all lawn areas by means of the sprinkling system, and the areas shall be kept moist, but not wet, until the first cutting of grass. After first mowing, irrigate lawn to maintain a thriving condition.
3. Lawns shall be kept green and vigorously growing at all times.
4. An application of fertilizer shall be applied as directed on the 35th and the 60th day, and then every 45 days thereafter until it is approved by the Parks Division.
5. At completion of the maintenance period, all areas including sidewalks and gutters shall be clean and free of debris and weeds. All plant materials shall be live, healthy, free of infestations or weeds, and be of acceptable growth until the 100% bond release. The contractor shall obtain a written release from the Parks Division before ending maintenance obligations.
6. Corrections & Replacements shall be done immediately prior to start of maintenance period.

4.13.17 **Herriman City Approved Tree and Shrub List.** The trees and shrubs listed below shall comply with the following areas.

1. Park Strip Trees. The following trees are allowed in all park strips.
 - A. *Acer platanoides* 'Columnar' (Columnar maple)
 - B. *Celtis occidentalis* (Hackberry, Common, Prairie Pride, Chicagoland)
 - C. *Corylus collurna* (Turkish Hazel)

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- D. *Fraxinus mandschurica* (Manchurian ash)
 - E. *Ginkgo biloba* (Maidenhair tree, any hybrid variety)
 - F. *Pyrus calleryana* 'Chanticleer/Cleveland' (Flowering Pear)
 - G. *Pyrus calleryana* 'Capital' (Capital flowering pear)
 - H. *Quercus bicolor* (Swamp White Oak)
 - I. *Tilia cordata* (Littleleaf Linden)
2. Open Space Large Trees. The following are large sized open space trees.
- a. *Acer platanoides* (Norway maple, Emerald Queen, Cleveland, Emerald Lustre, Parkway, Deborah, Fairview)
 - b. *Fraxinus Americana* (White ash; Autumn Purple, Autumn Applause)
 - c. *Fraxinus pennsylvanica* (Green ash; Marshall Seedless, Summit, Patmore, Bergeson, Cimmeron)
 - d. *Gleditsia tricanthos* (Honeylocust; Imperial, Skyline, Shademaster)
 - e. *Platanus acerifolia* (Sycamore/London plane tree)
 - f. *Pyrus calleryana* (Flowering pear; Aristocrat, Bradford, Redspire, Stonehill, Trinity)
 - g. *Quercus robur* (English oak; Skymaster)
 - h. *Quercus robur fastigiata* (Columnar English oak)
 - i. *Quercus rubra* (Red oak)
 - j. *Tilia Americana* (American Linden; Redmond)
 - k. *Ulmus x hybrids* (Hybrid Elms; Allee, Prospector, Accolade, Frontier, Homestead, Pioneer)
 - l. *Zekova serrata* (Zelkova, Green Vase, Village Green)
3. Open Space Medium Trees. The following are medium sized open space trees.
- a. *Craetagus crus-galli* (Thornless cockspur hawthorn)
 - b. *Craetagus lavalleyi* 'Carrierei' (Carriere hawthorn)
 - c. *Malus Spring Snow* (the only crab that is truly fruitless)
 - d. *Koelreteria paniculata* (Goldenrain tree)
 - e. *Albiza Juibrissin* (Silk tree)
 - f. *Catalpa Speciosa* (Northern Catalpa)
4. Open Space Small Trees. The following are small sized open space trees.
- a. *Cercis Canadensis* (Eastern redbud; also Forest Pansy)
 - b. *Malus Golden Raindrops* (Golden Raindrops flowering pear)
 - c. *Malus Centurion*
 - d. *Malus Donald Wyman*
 - e. *Malus Indian Magic*
 - f. *Malus Prairie Fire*
 - g. *Malus Snowdrift*
 - h. *Malus Red Baron*
5. Conifers/Evergreens. The following Conifers/Evergreens may be planted in open spaces.
- a. *Abies concolor* (White fir)
 - b. *Cedrus atlantica glauca* (Blue atlas cedar)
 - c. *Pinus lucodermis* 'Heldrechii' (Dwarf Austrian Pine)
 - d. *Pinus nigra* (Austrian pine)

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- e. Vanerwolf Pine
- 6. **Prohibited trees.** The following are prohibited within the Herriman City public right-of-way.
 - a. *Acer negundo* (Box Elder tree)
 - b. *Acer saccharinum* (Silver Maple)
 - c. *Eleagnus angustifolia* (Russian olive)
 - d. *Morus alba* (Fruitless Mulberry)
 - e. *Populus species* (including cottonwoods and aspen)
 - f. *Prunus cerasifera* (Flowering plum)
 - g. *Robinia* (All species of Robinia)
 - h. *Salix species* (including all trees in the willow family)
 - i. *Sophora japonica* (Japanese pagoda)
 - j. All species of Birch
 - k. All species of Poplar
 - l. All variety of bearing fruit or nut trees
 - m. Balm of Gilead
 - n. Chinese Date
 - o. Gambe Oak
 - p. Kentucky Coffee tree
 - q. May Day tree
 - r. Saskatoon Service berry
 - s. Siberian Elm
 - t. Black Locust
- 7. **Shrubs.** The following shrubs are acceptable.
 - a. *Amorpha canescens* (Leadplant)
 - b. *Berberis supp.* (Barberry Species)
 - c. *Buddleia davidii* (Butterfly Bush)
 - d. *Buxus supp.* (Boxwood species)
 - e. *Caragana arborescens* (Siberian Peashrub)
 - f. *Caryopteris x clandonensis* (Bluebeard)
 - g. *Cercocarpus supp.* (Mountain Mahogany)
 - h. *Cotinus cggygria* (Smoke Bush)
 - i. *Cornus supp.* (Dogwood Species)
 - j. *Cotoneaster supp.* (Cotoneaster)
 - k. *Euonymus supp.* (Euonymus Species)
 - l. *Fallugia paradoxa* (Apache plume)
 - m. *Forsythia intermedia* (Forsythia)
 - n. *Hibiscus syriacus supp.* (Rose of Sharon species)
 - o. *Juniperus supp.* (Juniper Species)
 - p. *Mahonia aquifolium* (Oregon Grape)
 - q. *Mahonia repens* (Creeping Oregon Grape)
 - r. *Philadelphus supp.* (Mockorange Species)
 - s. *Physocarpus supp.* (Ninebark Species)
 - t. *Pinus mugho* (Mugho Pine)
 - u. *Pinus sylvestris* "Hillside Creeper" (Hillside Creeper Pine)
 - v. *Potentilla fruticosa* (Potentilla)

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- w. *Prunus cistena* (Sand Cherry)
- x. *Rhus supp.* (Suma Species)
- y. *Rosa supp.* (Rose Species)
- z. *Shepherdia argenta* (Silver Buffaloberry)
- aa. *Spiraea supp.* (Spirea Species)
- bb. *Symphoricarpos x chenaultii* (Snowberry)
- cc. *Syringa spp.* (Lilac Species)
- dd. *Viburnum spp.* (Viburnum Species)

4.13.18 **Stamped Concrete.** In some areas the City may require stamped concrete in the park strip. These areas shall have diamond shaped tree wells along the roadway.

4.13.19 **Trails.** Trails shall comply with the following standards:

1. **Asphalt Trail.** Asphalt trails shall be 8' wide, with 3" of asphalt and 6" compacted untreated base course. Construction shall comply with *Standard Plan LP-04*. All trails will be asphalt trails unless specifically requested otherwise by the Planning Commission.
2. **Soft-Surface Trail.** Soft-surface trails shall be 8' wide, with 6" of clean, recycled asphalt placed over compacted native subgrade. Construction shall comply with *Standard Plan LP-04*.
3. When asphalt trails and soft-surface trails are placed side-by side, match grade.

4.14 Irrigation System Design

Irrigation systems shall be designed according to the following requirements.

4.14.01 **Excavation and Backfill.** Site shall be ripped or tilled at a minimum depth of 12", prior to installation of irrigation system.

1. **Trenches - General.** Trenches for irrigation pipe (plastic, brass, and/or ductile iron) sprinkler lines shall be excavated either by hand or machine and shall be a sufficient width to permit proper handling and installation of the pipe and fittings. The backfill shall be thoroughly compacted and leveled off with the adjacent soil level. Selected fill dirt or sand shall be used if soil conditions are rocky or obstructive. Trenching depth shall be two (2) inches below normal trench depth to allow for proper bedding.
 - a. Where trenching is done in established lawn, care will be taken to keep the trenches only as wide as is necessary to accomplish the work. The trenches shall be backfilled as specified above and then 4-inches of topsoil will be placed to bring the trench up to existing grade so that sod can be laid. The new sod shall be first grade sod of standard width and shall be laid along the trenches so as to match the existing sod. No

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small pieces of sod shall be used and only standard lengths shall be accepted. No sod from the construction site shall be used unless otherwise specified.

2. Trenches – Depth. Pipe depth for all plastic pipes shall be 18-24 inches on main lines and 12-18 inches on lateral lines with the appropriate fill as specified above.
3. Backfill Composition Rock Free: Fill dirt or sand shall be used as bedding up to four (4) inches above the pipe. The remainder of the backfill shall contain no lumps or rocks larger than two (2) inches in diameter. The top six (6) inches of backfill shall be free of rocks more than one inch in diameter.
 - a. No backfilling of trenches shall be done until the system has been inspected for proper trench depths, installation of equipment, control wire and location of heads by the City.
 - b. Before trenches are backfilled, the Contractor must show the City the redlined “as-built” drawing he has been keeping on the site, showing that changes and corresponding dimensions have been recorded where changes have been made.
 - c. Backfill under and around the lines to the center line of the pipe shall be placed in maximum layers of 10-inches and thoroughly compacted.
 - d. Special care shall be taken to assure complete compaction under the haunches of the pipe. Backfill compaction under the haunches of the pipe shall be compacted to the original density. Compaction requirements above the pipe shall be the same as for surrounding areas.
 - e. All trenches shall be backfilled then saturated with water sufficiently to ensure no settling of the surface after lawn is planted or sod is replaced.
4. Excavation Under Hard Surfacing. Any excavation in or under the roadway, curb, gutter and /or sidewalk shall conform to the Herriman City Standards, Specifications, and plans.
5. Trenchless Installation. Pulling or plowing is not allowed.

4.14.02 Pipe, Tubing and Fittings.

1. General Requirements. Plastic pipe shall be extruded from PVC 1120-1220 compound and should be labeled. All PVC pipe shall be Schedule 40. Three inch or greater use CL 200 with Parks approval.
2. Description. This specification covers requirements for Schedule 40 PVC pipe and fittings made from Type 1 Polyvinyl Chloride.
3. Materials. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Type 1, Grade 1 Polyvinyl Chloride, as outlined in ASTM D-1684. A Type 1, Grade 1 compound is characterized as having the highest requirements for mechanical properties and chemical resistance. PVC Type 1, Grade 1 pipe compound shall have a 2000 PSI design stress at 74 degrees F, which is listed by the Plastic Pipe Institute (PPI). Materials from which pipe and fittings are manufactured shall have been

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- tested and approved for conveying potable water by the National Sanitation Foundation Testing Laboratory (NSF).
4. Pipe. All pipe used on the project for the sprinkler irrigation system shall conform to the requirements of ASTM D-1685.
 5. Fittings. All fittings used on the project for the sprinkler irrigation system shall conform to the requirements of ASTM D-2466.
 6. Piping Under Paving. All piping under paving shall be installed in Schedule 40 PVC sleeves. Sleeves shall be installed under all hardscape surfaces. All sleeves shall be twice the size (diameter) of supply pipe. Piping under paving shall be installed by jacking, boring or hydraulic driving. Cutting or breaking of sidewalks and/or concrete work is not permitted unless no other alternative is possible. Piping shall be located so that a minimum of pipe shall be located under paving.
 7. Plastic Pipe Fittings and Connections. All plastic pipe fittings shall be suitable for either a solvent weld or a screw on connection. Fittings shall be Lasco, Dura, or Spears Factory assembled fittings or approved equivalent. All fittings shall be Schedule 40 PVC, except for gasketed Ductile Iron push on 2" plus. All PVC slip joints shall be primed with Weldon P-70 or approved equal prior to being glued. Glue shall be a Weldon 711, gray heavy bodied fast seal or approved equivalent and should follow the manufacturer's requirement as per size, weather, age, etc. Burrs at cut ends shall be removed prior to installation to guarantee a smooth unobstructed flow of water.
 8. Pipe Sleeves. Pipe sleeves shall be required under all new concrete or other new paving. The size of the sleeve shall be at least 2-inches (I.D.) larger than the pipes or wires required for the sprinkler system. Wires shall be sleeved separately within their own sleeve. All pipe sleeves shall be PVC Schedule 40 pipe.
 9. Installation of Plastic Pipe. Plastic pipe shall be installed in a manner so as to provide for expansion and contractions as recommended by the manufacturer. Plastic pipe shall be cut with a hand saw or hack saw with the assistance of a squared-in sawing vice, or with an approved PVC pipe cutter, in a manner as to insure a square cut. Burrs at cut ends shall be removed prior to installation to necessitate a smooth unobstructed water flow. Pipe shall be "snaked" in the trench to allow for expansion and contraction.
 10. Thrust Blocks. Thrust blocks are needed wherever the main line:
 - a. Changes any direction at tees, angles, and crosses vertical and horizontal.
 - b. Changes size at reducers.
 - c. Stops at a dead-end.
 - d. Valves at which thrust develops when closed.
 11. Thrust blocks shall rest against undisturbed original earth in the direction of the thrust. The size and type of thrust block depends on pressure, pipe size, kind of soil, and type of fitting.
 12. Upward Thrusts at Fittings. Where a fitting is used to make a vertical bend, use a bar anchor to anchor the fitting to a thrust block braced against

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undisturbed soil. The thrust block should have enough resistance to withstand upward and outward thrusts at the fitting.

13. Flushing and Testing. After the irrigation pipes have been installed, but before the bubblers or heads are installed, the control valves shall be opened to flush the system. The sprinkler main lines shall then be pressure tested before backfilling. The water pressure test shall be for a period of not less than one hour, and shall prove there are no signs of leakage or loss of pressure at 150 psi.
 - a. The point of connection must be flushed and tested for leaks prior to back filling.
 - b. The mainline must be flushed prior to the installation of station/control valves.
 - c. The lateral lines must be flushed prior to the installation of sprinkler heads, drip lines, etc.

4.14.03 Bubblers, Heads, Gate Valves, Drain Valves and Quick Couplers. All valves must have a threaded union (see detail). All automatic irrigation valves will have one (1) shut-off/isolation gate valve per sprinkler valve located upstream from the control valve. All products must be approved in writing prior to installation. This is done for standardization purposes and inventory control.

1. Sprinkler Heads. All sprinkler heads shall be set to grade and perpendicular to the finished grade, unless otherwise specified. Heads adjacent to curbs and walks shall be two inches away from the curb or walkway. All nozzles shall be tightened and adjusted for the proper radius, arc, and flow rate (gpm).

Acceptable Heads		
	Manufacturer	Model
Rotors	Rainbird	Falcon
	Rainbird	5000+
	Hunter	120
	Hunter	140
Spray	Rainbird	1804 SAM-PRS
Bubbler	Rainbird	(commercial grade)
	Hunter	(commercial grade)
	Toro	(commercial grade)

SPECIAL NOTE: EXTREME CARE SHALL BE TAKEN IN THE LAYOUT AND INSTALLATION OF HEADS.

2. Isolation Gate Valves. All gate valves shall be resilient-wedge having a square key with a non rising stem with rubber "O" rings and be rated for 200 psi water, oil, gas. (i.e., Milwaukee series 105 gate valve or approved equivalent). Stems shall be of cold rolled, solid bronze, high tensile strength. Valve shall be high strength cast iron, fully encapsulated urethane rubber wedge. Gate valves shall be hydrostatically pressure tested for 400 PSI shall be designated for a working pressure of 200 PSI, and shall be American made for water

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- application. All gate valves shall be installed within valve boxes. Six (6) inch or twelve (12) inch extensions shall be added, when necessary, to bring the valve boxes level with finish grade. Unless otherwise shown or specified, valves on the main line sized 2" and larger shall have flanged end connections. Valves 1½" and smaller shall have threaded end connections i.e., non-rising stem. Buried valves shall have 2" square operating nuts. No handles or wheels will be permitted. Valves inside structures shall have wheel handles. Unions shall be installed on each side of all valves except flanged valves. Each valve shall contain a resilient wedge urethane rubber seat.
3. The **Contractor** shall provide adequate material for the connection of valves to the system, i.e., adapters, flanges, nuts, bolts, gaskets, etc.
 4. **Manual Drain Valves.** Manual drain valves shall be required at all low points in the main lines. See plans, notes, and details.
 - a. All manual drains shall be Ford B11333 series or Mueller B20283 heavy duty brass, ball valves.
 - b. The location of each manual drain shall be shown on the "as built" drawing with dimensions from the nearest permanent fixture, such as a building corner, etc.
 - c. Each manual drain valve will be accessed by a 2 inch PVC Schedule 40 pipe sleeve, capped by a Weathermatic 906L locking valve cap with a RLK-1 key, no approved equals, enclosed within a 10" round Brooks Bolt down box - top of drain sleeve to be 3" - 6" below lids of Brooks Box.
 - d. Each manual drain shall empty into a gravel sump, a minimum of 18 inches by 18 inches by 12 inches deep. The gravel shall be washed ¾ inch rock. No pea gravel will be allowed.
 5. **Automatic Drain Valves.** Automatic drain valves shall not be used.
 6. **Quick Coupling Valves.** A quick coupling valve shall be installed on all main lines immediately after the backflow prevention device. In addition, a quick coupling valve shall be installed at every valve box or valve box cluster. All quick coupler valves shall be Rainbird #44LRC and installed in a ten-inch round valve box. Each valve shall also be teed off the supply line with at least 24 inches of galvanized iron pipe and all fittings from that point up shall be galvanized iron. A Ford B11444 series or Mueller B20284 heavy duty manual ball valve shall be installed upstream from each quick coupler or group of quick couplers on one supply line for water shut-off and maintenance. Access ball valve shall be a 2" PVC sleeve-capped by a Weathermatic 906L cap, within a 10" round Brooks Box (no substitutions).
 7. **Manifold Gate Valve.** Milwaukee brand or approved American-made brass valve with non-rising stem (line sized).
 8. **Quick Coupling Valve Keys.** All quick coupling valve keys shall be Rainbird 44K and shall have a hose swivel attached to the key. At least one valve key and one cap lock key shall be turned over to the Parks Division at completion of the project.
 9. **Sprinkler Risers.** All rotor pop-up sprinklers shall be installed with double swing joint. Spray pop-up sprinkler heads shall have a double swing joint

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riser, constructed of funny pipe, barbed fittings and Marlex street ells on the head side (*see Standard Plan IR-11*).

10. Heads. All heads used on this project shall be as specified in the materials listed on the plans.
 - a. All heads shall be installed above grade so as to minimize washing of the topsoil and seed during the landscaping establishment period, except those which border paving or flat work of any kind. These heads shall be installed at the finished grade of the adjacent paving or flat work.
 - b. Heads installed in existing sod shall be set at the grade of the soil.
 - c. All rotary pop-up heads shall be installed at final grade on double swing joints. See detailed drawings. All swing joints must drain by gravity back to the supply lines.
 - d. All pop-up, shrub spray, lawn spray, bubbler and strip spray heads shall be installed as shown in the details.
 - e. All pipes, lines, and risers shall be flushed thoroughly with water before installation of any heads. All debris and rocks found at that time shall be removed from the area as soon as possible.
 - f. Heads shall be space at a minimum of 2" from all sidewalks, curbs or hard surfaces.
11. Bubblers. Bubblers shall be provided at each tree within turf areas. At no time shall bubblers run on the same control valve as sprays or rotors. Bubblers shall be placed on the uphill side of the tree.
12. Prior to final acceptance of the project, **all heads** shall be raised or lowered to final lawn or planting grade or as specified by the City.

4.14.04 Irrigation Controller and Control Valve. The controller shall be a Rain Master Evolution DX2 Controller with a T-option (lightning arrestor). The controller shall be enclosed in a Stainless Steel VIT Products INC Strong Box SD-12DSS/ SD-24DSS or Approved Equal with a retrofit panel or an Evolution DX2 locking vandal proof stainless steel box as determined by the Parks Department. All controllers shall be on the Herriman City UHF frequency and shall allow DTMF tone operation for sprinkler controls. Battery/solar operated controllers shall not be allowed. All controllers shall be mounted on a stable wall or a formed concrete based pedestal mount.

1. The Contractor/Developer is responsible for a 110 volt electrical service. This service must be metered. This connection shall be inspected and approved by the City Division of Building and Safety. All 110 wires shall be in a minimum of 1½" conduit and buried at least 24 inches deep. All local, State and National Codes shall take precedence in the furnishing and connecting of 110-volt electrical service to the controller.
2. It shall be the Contractor's responsibility to install and supply a GFCI protected plugged outlet, junction box or separate breaker to furnish power to a new controller. Surge protection shall also be provided at the incoming power and low voltage power side grounding as per national electrical code. Bond ground rods when more than one is used.

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3. The Contractor shall be required to provide conduit, wiring, and all materials along with the labor necessary to make the controller operational and in compliance with adopted electrical codes.
4. When an existing controller is used for part of a new sprinkler irrigation system, the Contractor shall coordinate the setting, wiring, use, and all maintenance operations pertaining thereto, with the City park maintenance personnel.
5. Box must be keyed to City standard key system.
6. Wiring. All wiring shall be in accordance with the following:
 - a. National Electric Code.
 - b. International Building Code.
 - c. Recommendations by the Parks Division and/or the Division of Building and Safety.
 - d. All wiring to be continuous.
 - e. If splices are necessary, they are to be housed in a minimum ten-inch round valve box with a "3M DBR or DBY" dry splice or approved equivalent with 6' extra coiled in a box.
 - f. All wiring under pavement or asphalt shall be in conduit.
 - g. It shall be the Landscape Architect's or Contractor's responsibility to call out any conflict between the above listed codes.
7. All irrigation control wire shall bear approval as U.L. type of underground feeder and each conductor shall be of electrical conductivity grade copper in accordance with ASTM-30. All control wire shall be specifically designed for direct burial use. Control wire shall be #14 solid core UF. A minimum loop of 24 inches shall be coiled and left at each valve, at each splice, and at each controller and 36 inches at each corner for expansion and/or servicing of the wire. All wire, crossing water, attached to bridges, going under paving, or where conditions require protection, shall be housed in conduit or sleeves, all out of ground conduits shall be rigid metal conduit. All buried conduit and fittings shall be electrical PVC conduit.
8. Multiple wires in the same trenches shall be banded together at 10 foot intervals for protection. Where wires pass under paved areas, Schedule 40 PVC sleeves shall be installed prior to installation of the paving, if possible, and prior to installation of the wires. Sleeves shall be sized as follows: 1-11 wires in 1¼ inch pipe; 12-15 wires in 1½ inch pipe, etc.
9. Electric Remote-Control Valves. Valves shall be installed as specified on drawings and approved by the Parks Division. Remote-control valves shall be installed in a valve box (i.e., Carson Brooks Standard model 1419-12 or approved equivalent, Note: this is the minimum size). There shall be no more than one valve per box and the valve must be positioned so the top of the valve can be removed without removing the valve box. All valve boxes must be installed at a finish grade. All valves must be installed with a threaded union on the downstream side of the valve. All valves will have one (1) shut-off isolation ball valve per sprinkler station installed up stream of the station valve. The station valve and the isolation ball valve must be installed in the same valve box with adequate room for service.

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- a. Control valves shall be installed as specified by the plans. Each valve shall be brass globe diaphragm and electrically activated. Control valve shall be a Rainbird GB-PRS. No valve shall be installed more than 12 inches below finished grade. All pipe on the control valve manifolds shall be Schedule 80 PVC pipe. See the detailed drawing in the section following.
10. Contractor shall install a Rain Master DX-Flow sensing circuit board.
11. Contractor shall install a Rain Master DX-Radio-Kit.
12. Contractor shall install a Rain Master DX-ANT-DISC low profile antenna.
13. Contractor shall install Netafim Master Valves on all main lines at the point of connection. Locations shall be determined by the Parks Department.
14. Contractor shall install Rain Master FS Flow Sensors on all main lines at the point of connection. Location shall be determined by the Parks Department. Flow sensor shall be one size smaller than mainline. On mainlines 1/4" and smaller, the flow sensor remains the same size. Mainlines 1/2" and larger a plastic flow sensor is required.
15. Contractor shall install Rain Master EV-CAB-SEN sensor cable.
16. Contractor shall install a 5/8" x 8' grounding rod, with a No. 6 bare copper wire to the controller.

4.14.05 Connection and Cross Connection Control.

1. Connection Fee. The Contractor/Developer shall pay the appropriate water connection fee for the water meter, prior to any construction.
2. Connection to Mainline. The Developer/Contractor shall be responsible for installing the tap to the City water main. This includes all applicable labor, materials, road cuts and road cut permits. Prior to making a connection, the Developer/Contractor must have written approval for the landscape water connection by the Engineering Division.
3. General Requirements. To ensure compliance with the regulations of the State of Utah, which prohibits unprotected cross connections between the public water supply and any unapproved source or connection, the City requires the installation of approved backflow prevention devices. The backflow prevention device is to be installed by the Contractor/Developer at his expense. The degree of hazard and the type of backflow prevention device required to abate the cross-connection shall be determined by the developer's engineer and reviewed and approved by the City. Maintenance, testing, and repair of the devices shall be as designated in the City's cross connection control ordinance.
4. Backflow Prevention Requirements, Inspections and Tests. Back flow prevention devices shall be selected from a list of approved devices set forth by the City Water Department. Reduced Pressure Assemblies (RP) shall be the only accepted styles of back flow prevention devices. This selection shall then be approved by the City Water Department prior to installation. Each device shall be installed in compliance with the current International Plumbing Code and Utah Department of Environmental Quality Division of

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Drinking Water regulations. Each device shall be tested within ten (10) days of installation and at least once yearly thereafter by a back flow technician licensed by the State of Utah. The location of each device shall be reported to the City Water Department and City Parks Division in writing within ten (10) days of installation. Refer to the cross connection control ordinance for additional details.

5. Backflow Prevention Location. Location of the installation of the back flow prevention device shall be approved by Herriman City prior to installation.
6. Reduced Pressure Assembly (RP) (see standard details)
 - a. The assembly shall be protected from freezing and vandalism.
 - b. The bottom of the RP assembly shall be a minimum of 12 inches above the ground.
 - c. The body of the RP shall be a minimum of 12 inches from any walls, ceilings, or encumbrances and shall be readily accessible for testing, repair, and maintenance.
 - d. RPs shall not be installed in a pit
 - e. RPs shall not be installed in a vault.
 - f. The relief valve on the RP shall not be directly connected to any waste disposal line, such as sanitary sewer, storm drains, or vents.
 - g. The RP shall be maintained as an assembly.
 - h. The RP shall be installed in a horizontal position only.
 - i. All outlets on potentially contaminated systems shall be posted (use properly colored pipe- purple is common):

DANGER - UNSAFE WATER

4.15 Irrigation and Planting of Parks and Streetscapes

The following standards and specifications are established as minimum requirements for landscape architects, contractors and developers in the preparation and installation of Irrigation and Landscape Projects within Herriman City. For the purpose of this chapter, the Developer and Contractor are considered one and the same.

4.15.04 **Latest Industry Standards and Practices.** The requirements herein are set in two major areas: irrigation systems and planting. These are set as minimum standards. These standards are not intended to limit the installation but are intended as an absolute minimum. The City is willing to clarify any questions that you may have on these specifications and standards. The Parks Division will not design or engineer the project.

1. Parks Division must receive a set of detailed plans to be approved by the Parks Division before construction is started. The plans need to include psi, flow rates, head spacing, and controller location including the power source, and plant locations where applicable. Due to high winds in the area, manufacturer's maximum head spacing to be set according to manufacturer's specifications, reduced by 25%. Site layout may require tighter spacing.

SECTION 4: DESIGN REQUIREMENTS

- Developer shall ensure that all areas receive double coverage at a minimum.
2. As specified in this chapter, closing in of un-inspected work will require reopening or re-exposing of items to be inspected at the contractor's expense. Trees or plants that do not meet the planting specifications will require replacement, at the contractors own expense. Any changes must be applied for in writing and approved in writing prior to any installation.
- 4.15.05 **Submittals.** Operation and maintenance manuals and an "As Built" set of plans must be submitted to the Parks Division before inspection and approval can be considered complete.
- 4.15.06 **Streetscape Size Location.** Streetscapes and Parks shall be constructed to the sizes, grades and locations as stated in the plans approved by the city and stated herein.
- 4.15.07 **Construction Specifications.** The landscaping project shall include, but is not limited to, the furnishing, installing and testing of irrigation mains (150 PSI for one hour), tying into the main water line, running service to site, back flow prevention device and furnishing and installing of water meter(s), flow meters sprinkler heads, bubblers, gate valves, control valves, automatic valves, automatic controllers, field wiring, topsoil, turf, trees, shrubs, and any metered electrical connection to provide an irrigation system that meets or exceeds best construction practices. The removal and/or restoration of existing improvements, excavation and backfill, and all other work shall be in accordance with the Herriman City Public Improvement Standards, Specifications and Plans.
- 4.15.08 **Competence.** All Irrigation work shall be supervised full-time by a competent, qualified supervisor.
- 4.15.09 **Liability.** The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damage, injury, or loss due to acts or neglect by the Contractor or the Developer.
- 4.15.10 **Signs, Fences, Barricades.** The Contractor shall, at all times during construction, maintain safe pedestrian walk ways around all areas of construction. This may require the appropriate signage, fences, barricades or other approved devices as required by the Public Works Department or Parks Division.
- 4.15.11 **Inspections.** All Contractors are required to follow an inspection schedule as per Herriman City Public Improvement Standards, Specifications, and Plans. Should any of the work be covered or completed before inspections and test, the Contractor shall uncover the work at their own expense. All hard surfaces shall be cleared of construction debris.
- 4.15.12 **Ordinances and Regulations.** The Local, Municipal and State law, rules and regulations are to be used when designing and installing landscapes, irrigation and plant material. They are to be used as a minimum standard and carried out by the

SECTION 4: DESIGN REQUIREMENTS

Contractor, Developer and Landscape Architect. However, these City Specifications will take precedence over the Local, Municipal and State laws when they describe materials, workmanship or construction of higher standards.

- 4.15.13 **Permits & Fees.** All permits and fees shall be the Developer's responsibility.
- 4.15.14 **Bonding and Inspection.** The sprinkler system and landscape planting shall be bonded as part of the entire development project. Bond releases shall be handled through the Engineering Division. The Parks Division shall sign off the release in the above areas only for 75% and 25% bond release and only when all requirements contained herein have been met.
- 4.15.15 **System Pressure.** The sprinkler irrigation system is designed for actual system pressures unless otherwise specified and is schematic only, with the intent to convey full coverage of the lawn and planting areas affected. The system must also provide the manufacturer's recommended minimum operating pressure or greater to every head while maintaining sufficient pressure to overcome the losses due to friction in the piping, fittings and all other equipment.
- 4.15.16 **Materials.** Any material that is called out in these specifications by name and/or number shall be used for the purpose of uniformity and quality control. No substitution shall be permitted without written approval by the Parks Division.
- 4.15.17 **Inspections and Procedures.** All irrigation inspections shall follow the requirements listed below.
1. An approved set of plans and up to date redlines are required for all inspections.
 2. Due to Utah having a limited growing season no inspections will be performed from October 31 through March 31, unless conditions permit and at the Park Division's discretion.
 3. The Developer shall set up an inspection schedule with the Parks Division. Prior to each inspection date, the Contractor shall give twenty-four (24) hours notice to the Parks Division. There shall be a minimum of five (5) inspections. The Developer may not proceed to the next phase of construction until the previous phase has been inspected and approved. In the event that the Developer requests inspection of work and said work is substantially incomplete, the Contractor shall be responsible for all re-inspection fees. The inspections are as follows:

First Inspection	Subgrade, trench, painting and staking.
Second Inspection	Pipe sizing, trench depths and redlines.
Third Inspection	Final irrigation, coverage test, with final grade pre-planting.
Fourth Inspection	Punch list development for 75% bond release.
Fifth Inspection	Final release and water pressure test.
Additional Inspection	May be required.

SECTION 4: DESIGN REQUIREMENTS

4. After installing the irrigation main line, the Contractor shall schedule the first inspection from the Parks Division.
5. The Developer shall maintain the property for a period of eighteen months following the 75 percent bond release. During this warranty period the Contractor is responsible for all aspects of maintenance including, but not limited to, mowing, fertilizing, irrigation scheduling and repair, play system maintenance and all safety inspections.
6. At the end of the twelve month warranty period, a 5th inspection shall be scheduled by the Contractor. If at that point the project is still deemed satisfactory, the City shall assume the maintenance of the property. Developer shall repair or replace (at his expense) any irrigation or plant material deemed unsatisfactory prior to final release. The fifth inspection may be delayed if vegetation is not properly established and thriving. Developer will continue to maintain until such time that the vegetation is established and thriving. Then, the fifth inspection shall be scheduled. The Developer shall obtain written approval from the Parks Division stating that the City has officially assumed maintenance and that all work has been completed according to City Standards before final bond release will occur.
7. **As Built:** The Landscape Architect/Contractor shall furnish the Parks Division with preliminary plan sets for review, showing all irrigation and landscaping work required. After initial review by the City, the Landscape Architect shall make all noted corrections as discussed with the staff. The Landscape Architect shall submit final plan sets to be signed and approved by the Parks Division along with an electronic copy in AutoCAD format (see *Section 2* for acceptable format). Upon completion of the installation, the Contractor /Developer shall submit the as-built to the Parks Division. The Parks Division shall receive the corrected set of as-built plans prior to accepting the project for final release.
8. Fifth Inspection shall not occur prior to one full growing season of the system (at least one year from satisfactory fourth inspection). This period shall include startup and shut down of system with City Parks personnel.

4.16 Playground Equipment Specifications.

Playground equipment shall comply with all requirements listed below.

- 4.16.04 **ASTM, ADA, CPSC.** All Playground equipment must comply with standards of the American Society for Testing and Materials (ASTM), the Consumer Product Safety Commission (CPSC) and Americans with Disabilities Act (ADA). This must include adequate safety surfacing and transfer points or ramps to an appropriate number of elevated play components.
- 4.16.05 **Playground Equipment.** All playgrounds equipment shall be Game Time or Miracle Recreation equipment manufacturers. Playground equipment should meet the following specifications:

SECTION 4: DESIGN REQUIREMENTS

1. Posts. Steel posts shall be constructed of 5" tube with 5" round end caps mechanically fastened to the top end. After fabrications, all posts and end caps shall be PVC coated.
2. Decks. All decks shall be PVC coated punched steel. All deck-to-post connections shall be made beneath deck with no exposed fasteners on deck perimeter.
3. Slides, Tubes, Roofs, and Panels. All slides, tubes, roofs and panels shall be constructed of colored rotationally molded plastic. Any legs, clamps and handholds shall be PVC coated.
4. Standard Steps. Standard steps shall have 9" rise by 9" tread. ADA steps shall have 6" rise by 18" treads. The stair assemblies shall be PVC coated. Deck enclosures, spoked and open handrail enclosures, sleeves and clamps shall be PVC coated.

4.16.06 **Surfaces.** All playground equipment must be installed over an acceptable impact absorbing surfacing material. It is the responsibility of the playground designer, installer and operator to ensure that the size, type and depth of impact absorbing material used complies with the U.S. Consumer Product Safety Commission "Handbook for Public Playground Safety" (CPSC Handbook). This impact absorbing material must cover the entire "Use Zone" area to a depth appropriate for the height of the play equipment. The "Use Zone" is an area under each piece of play equipment. Acceptable impact absorbing surfacing materials include unitary safety surfacing such as pour-in-place rubber or rubber tiles, and natural loose fill materials such as bark nuggets, wood mulch, and wood chips. 12" of compacted wood chips and 6" of pea gravel separated by a non plastic weed fabric shall be placed under all "Use Zones".

4.16.07 **Use Zones.** Use zones are the areas under each piece of play equipment that must be covered with an acceptable impact absorbing surfacing material. The specific size of these use zones depend upon the type of play equipment as follows:

1. Regular Swings. The use zone must extend at least two (2) times the pivot point height to both the front and rear of the top rail. The use zone must extend at least six (6) feet out at each end from the swing frame.
2. Tire Swings. The use zone must extend at least six (6) feet plus the length of the suspension members in all directions. The use zone must also extend six (6) feet out at each end from the swing frame legs.
3. Slides. The use zone must extend at least six (6) feet in all directions from the perimeter of the slide. Also, in front slide exit measuring from the point where the slide slope is reduced to 5 degrees, the use zone must extend a total of four (4) feet plus the height of the platform.
4. All other play equipment. The use zone must extend at least six (6) feet in all directions from the perimeter of the play equipment.

SECTION 4: DESIGN REQUIREMENTS

4.16.08 **Playground Areas.** All playground areas shall have a 5' sidewalk around playground with a modified (20" tall, reinforced) APWA Plan # 209 Type Q curb. All playgrounds shall be ADA accessible.

4.17 Park Equipment Specifications

The park equipment installed within Herriman City shall conform with the requirements listed below.

4.17.01 **Benches.** All benches shall have the legs cemented in to an ADA accessible concrete pad. The finished height of the seat of the bench shall be 17". The bench shall be powder coated or PVC coated metal that allows water to pass through without pooling.

4.17.02 **Tables.** All tables shall have the legs cemented in to an ADA accessible concrete pad. All tables shall be powder coated or PVC coated metal that does not allow the accumulation of water to affect the integrity of the table.

4.17.03 **Pavilions.** All pavilions shall be ADA accessible.

4.17.04 **Gazebos:** All parks equipped with playground equipment shall have a gazebo. All gazebos shall be at a minimum 16' x 16' as manufactured by RCP Shelters, AS-16-06. Color shall be approved by the City. All gazebos shall be ADA accessible. Gazebos shall be equipped with two tables and legs of tables shall be cemented into a cement pad.

4.17.05 **Drinking Fountains:** Drinking fountains are required on all parks that have public parking. All drinking fountains shall be ADA accessible.

4.17.06 **Restrooms:** All restrooms shall be ADA accessible.

4.17.07 **Concessions:** All concession stands shall be ADA accessible.

4.17.08 **Park Signs:** All parks, tennis courts, trails, detention or retention ponds shall have a sign with Herriman City logo. The sign shall have all information regulated by Herriman City. For exact details of sign please contact the parks department.

4.17.09 **Submittals:** Three copies of all installation, maintenance booklets, and warranty information shall be provided to Herriman City prior to bond release.

**SECTION 5: STANDARD
SPECIFICATIONS**

SECTION 5: STANDARD SPECIFICATIONS

Section 5: Standard Specifications

**5th EDITION 2007 AMENDED - HERRIMAN CITY AMENDMENTS,
ADDITIONS AND CLARIFICATIONS**

to the

APWA MANUAL OF STANDARD SPECIFICATIONS – 2007 EDITION

AMENDMENTS, ADDITIONS AND CLARIFICATIONS

The following contains the 5th Edition of Herriman City's Amendments, Additions and Clarifications to the APWA Manual of Standard Specifications – 2007 Edition.

The standards and specifications contained in the following amendments, additions and clarifications revise the 2007 Edition of the APWA Manual of Standard Specifications and are applicable to all public works projects constructed under permit by Herriman City.

Should conflicts arise between the APWA Manual of Standard Specifications and the 5th Edition – Herriman City Amendments, Additions and Clarifications to the APWA Manual of Standard Specifications – 2007 Edition, the latter shall govern and take precedence.

END OF DOCUMENT

SECTION 5: STANDARD SPECIFICATIONS

**5th EDITION - HERRIMAN CITY AMENDMENTS,
ADDITIONS AND CLARIFICATIONS**

to the

APWA MANUAL OF STANDARD SPECIFICATIONS – 2007 EDITION

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END OF DOCUMENT

SECTION 5: STANDARD SPECIFICATIONS

**DIVISION 31
EARTH WORK**

**SECTION 31 05 13
COMMON FILL**

PART 2 PRODUCTS

2.5 NATIVE

Add paragraph B as follows:

- B. Maximum particle size shall not exceed 6" in the longest direction. All other larger native material which must be removed shall be deposited offsite from work zone at no additional cost to the OWNER. Native material meeting the above specification of maximum particle size shall not be removed from the work zone until ENGINEER has made a written determination that said material will not be reused in any application within the scope of the project.

2.8 GRAVEL

Revise Paragraph B Add Number 3 as follows:

3. Crushed stone or gravel meeting the following sieve ranges.

US Sieve Size	Sieve Gradation Ranges
1½"	100%
1"	75%
¾"	15%
½"	10%

SECTION 5: STANDARD SPECIFICATIONS

**DIVISION 32
EXTERIOR IMPROVEMENTS**

**SECTION 32 01 05
INFORMATION, REGULATORY,
AND WARNING SIGNS**

PART 1 GENERAL

1.2 REFERENCES

Add paragraph G as follows:

- G. ASTM 4956: Standard Specification for Retro-reflective Sheeting for Traffic Control.

PART 2 PRODUCTS

2.1 MATERIALS

Revise paragraph C to read as follows:

- C. Soft Plywood Sign Blank: PS 1 Group 1 with each panel bearing initials DFPA Grade – Trademark of the American Plywood Association; painted with weather resistant paint to ENGINEER choice of color unless indicated otherwise. Plywood sign blanks will be allowed at discretion of ENGINEER on limited and case by case basis, usually for the purpose of temporary or specialty signage.

Revise paragraph D to read as follows:

- D. Sign Posts: 2.375-in outside diameter 16 GA galvanized (per Section 32 01 05) steel posts with the properties listed below. Posts of other cross-sectional dimensions and material properties may be permitted upon ENGINEER approval.
1. Sign posts shall be approved by FHWA and AASHTO under the current NCHRP Report 350 requirements.
 2. Post material shall conform to ASTM-A653, G90 and HSLAS Type B.
 3. Post material yield strength; 55,000 psi minimum.
 4. Post material ultimate tensile strength; 70,000 psi minimum.
 5. Sign posts shall be powder coated (satin black) over galvanization to minimum dry thickness of 3.0-mm.
 6. Sign posts shall be capped with a powder coated (satin black) post cap, either decorative or standard, per OWNER directive.

Revise paragraph F to read as follows:

- F. Retro-reflective Sheeting: Engineering Grade (ASTM Level 1, Enclosed Lens), High Intensity Grade (ASTM Level 3, Encapsulated Lens) and Diamond Grade

SECTION 5: STANDARD SPECIFICATIONS

(ASTM Level 4, Prismatic Lens) retro-reflective sheeting conforming to the specifications set forth in ASTM D4956 and the following conditions.

1. The manufacturer shall warranty Engineering Grade retro-reflective sheeting for a period of seven years from the date of construction.
2. The manufacturer shall warranty High Intensity Grade and Diamond Grade retro-reflective sheeting for a period of ten years from the date of sign construction.
3. The retro-reflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that:
 - i. The sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision, or
 - ii. The coefficient of reflectivity is less than 80% of the initial specified coefficient of reflectivity after 70% of the warranty life and the coefficient of reflectivity is less than 70% of the initial coefficient of reflectivity after 100% of the warranty life.

Add paragraphs K and L as follows:

- K. Post Anchor: V-Loc model 23VR2 with stabilizer barb or approved equivalent including installation wedge with the following conditions.
1. Install anchor and wedge per manufacturer recommendations.
 2. Anchor shall be NCHRP Report 350 approved.
- L. Sign Messaging and Diagram Elements: Sign messaging and diagram elements applied to the surface of the retro-reflective sheeting in the form of inks and other sheeting materials. Inks and other materials shall be designed for use on traffic signs and be recommended by the sheeting manufacturer and shall be warranted to be effective for a period of time commensurate with the warranted life of the retro-reflective sheeting.

2.2 COLORS AND FORMAT

Add paragraphs C and D as follows:

- C. ASTM Level 4 retro-reflective sheeting is required on all yield and stop signs. ASTM Level 3 retro-reflective sheeting is required for all warning signs, no passing zones, signal ahead signs and other signs, per ENGINEER directive. ASTM Level 1 retro-reflective sheeting generally approved for other signs, per ENGINEER approval.
- D. ASTM Level 4 yellow-green retro-reflective sheeting is required for all school zone and pedestrian zone signs.

SECTION 5: STANDARD SPECIFICATIONS

PART 3 EXECUTION

3.2 INSTALLATION

Revise paragraph E to read as follows:

- E. Install sign post in V-Loc anchor or approved equal per manufacturer recommendation. Where custom sign post foundations are to be used, construct sign post foundations with concrete conforming to indicated dimensions. Finish foundations flush with or below natural ground.

Add paragraph G as follows:

- G. Sign blades shall be attached to the signpost with tamper resistant fasteners.

SECTION 32 01 06 POST MOUNTED SIGNS

PART 1 GENERAL

1.2 REFERENCES

Add paragraph C as follows:

- C. ASTM 4956: Standard Specification for Retro-reflective Sheeting for Traffic Control.

PART 2 PRODUCTS

2.1 MATERIALS

Revise paragraph A to read as follows:

- A. Sheet Aluminum Sign Blanks: 0.080-in thick ASTM B 209 alloy 6061-T6 double bladed signs riveted at both ends with stainless steel rivets and back washers; sign dimensions shall be 38.0-in length by 9.0-in height.

Eliminate paragraph B. No nonmetallic sign blanks shall be allowed.

Revise paragraph C to read as follows:

- C. Sign Posts: 2.375-in outside diameter 16 GA galvanized (per Section 32 01 05) steel posts with the following properties.
1. Sign posts shall be approved by FHWA and AASHTO under the current NCHRP Report 350 requirements.
 2. Post material shall conform to ASTM-A653, G90 and HSLAS Type B.
 3. Post material yield strength; 55,000 psi minimum.
 4. Post material ultimate tensile strength; 70,000 psi minimum.

SECTION 5: STANDARD SPECIFICATIONS

5. Sign posts shall be powder coated (satin black) over galvanization to minimum dry thickness of 3.0-mm.
6. Sign posts shall be capped with a powder coated (satin black) post cap, either decorative or standard, based upon OWNER directive.

Revise paragraph D to read as follows:

D. Retro-reflective Sheeting: Diamond Grade (ASTM Level 4, Prismatic Lens) retro-reflective sheeting conforming to the specifications set forth in ASTM D4956 and the following conditions.

1. The manufacturer shall warranty Diamond Grade retro-reflective sheeting for a period of ten years from the date of sign construction.
2. The retro-reflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that:
 - i. The sign is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by a driver with normal vision, or
 - ii. The coefficient of reflectivity is less than 80% of the initial specified coefficient of reflectivity after 70% of the warranty life and the coefficient of reflectivity is less than 70% of the initial coefficient of reflectivity after 100% of the warranty life.

Revise paragraph E to read as follows:

E. Sign Lettering: White upper case and lower case letters, electronically cut film reverse weeded on retro-reflective sheeting. Film color specified by the ENGINEER.

Revise paragraph F to read as follows:

F. Letter Composition: Spell out street name and give numerical coordinate below or vice versa, case dependant. Upper row lettering shall be 4.5-in height; lower row lettering shall be 2.25-in height. All lettering upper and lower case Helvetica font. Include City logo on right hand side.

Add paragraphs J and K as follows:

J. Post Anchor: V-Loc model 23VR2 with stabilizer barb or approved equivalent including installation wedge with the following conditions.

1. Install anchor and wedge per manufacturer recommendations.
2. Anchor shall be NCHRP Report 350 approved.

K. Sign Messaging and Diagram Elements: Sign messaging and diagram elements applied to the surface of the retro-reflective sheeting in the form of inks and other sheeting materials. Inks and other materials shall be designed for use on traffic signs and be recommended by the sheeting manufacturer and shall be warranted to be effective for a period of time commensurate with the warranted life of the retro-reflective sheeting.

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PART 3 EXECUTION

3.2 INSTALLATION

Revise paragraph A to read as follows:

- A. Install sign post in anchor per manufacturer recommendation.

Add paragraphs E, F and G as follows:

- E. Collector Streets: All sign posts installed on collector streets shall be capped with a decorative post cap, powder coated (satin black). All sign posts installed on collector streets shall have a decorative slip base, 31.0-in height, powder coated (satin black), per City specifications.
- F. Install signs on the north-west and south-east corners of the intersection.
- G. Sign blades shall be attached to the sign post with tamper resistant fasteners.

Add Section 32 13 14 Pervious Concrete Pavement:

SECTION 32 13 14 PERVIOUS CONCRETE PAVEMENT

PART 1 GENERAL

1.1 SCOPE OF WORK:

- A. The Work described by this guide addresses the labor, materials and equipment necessary for construction of pervious concrete pavement, including subgrade testing and preparation for a stormwater storage layer for temporary detention or groundwater recharge in conformance with the plans, specifications and other contract documents, for streets, parking lots, driveways, paths, sidewalks and other pedestrian areas.

1.2 REFERENCES:

- A. ACI 211.3R "Guide for Selecting Proportions for No Slump Concrete"
- B. ACI 305 "Hot Weather Concreting"
- C. ACI 306 "Cold Weather Concreting"
- D. ACI 522 "Report on Pervious Concrete"
- E. ACI Flatwork Finisher Certification Program
- F. ACI Field Technician Certification Program
- G. ASTM C 29 "Test for Bulk Density (Unit Weight) and Voids in Aggregate"
- H. ASTM C 33 "Specification for Concrete Aggregates"

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- I. ASTM C 42 "Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete"
- J. ASTM C 94 Specification for Ready-Mixed Concrete
- K. ASTM C 117 "Test Method for Material Finer than 75-gm (No. 200) Sieve in Mineral Aggregates by Washing"
- L. ASTM C 138 "Test Method for Density (Unit Weight), Yield and Air Content (Gravimetric) of Concrete"
- M. ASTM C 140 "Test Methods for Sampling and Testing Concrete Masonry Units and Related Units"
- N. ASTM C 150 "Specification for Portland Cement"
- O. ASTM C 172 "Practice for Sampling Freshly Mixed Concrete"
- P. ASTM C 260 "Specification for Air-Entraining Admixtures for Concrete"
- Q. ASTM C 494 "Specification for Chemical Admixtures for Concrete"
- R. ASTM C 595 "Specification for Blended Hydraulic Cements"
- S. ASTM C 618 "Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete"
- T. ASTM C 989 "Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars"
- U. ASTM C 1077 "Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation."
- V. ASTM C 1602 "Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete"
- W. ASTM D 448 Classification for Sizes of Aggregate for Road and Bridge Construction
- X. ASTM D 1557 "Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)"
- Y. ASTM D 1751 Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- Z. ASTM D 1752 Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
- AA. ASTM D 2434 Test Method for Permeability of Granular Soils (Constant Head)
- BB. ASTM D 3385 Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer
- CC. ASTM D 5093 Test Method for Field Measurement of Infiltration Rate Using a Double-Ring Infiltrometer with a Sealed-Inner Ring
- DD. ASTM D 5084 Test Methods for Measurement of Hydraulic Conductivity of

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Saturated Porous Materials Using a Flexible Wall Permeameter (Falling Head, Method C)

- EE. ASTM E 329 Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- FF. NRMCA Pervious Concrete Contractor Certification

1.3 SUBMITTALS:

- A. Mix Design: submit concrete mixture proportions including all material weights, volumes, density (unit weight), water-cementitious ratio, and void content.
- B. Aggregate type, source and grading.
- C. Cement, supplementary cementitious materials and chemical admixture manufacturer certifications.
- D. Aggregate base materials: Washed aggregate type, source, grading and void content (percent porosity).
- E. Qualifications: Evidence of qualifications listed under Quality Assurance in Section 1.4 of this guide.
- F. Project details: Specific plans including a jointing plan, details, schedule, construction procedures and quality control plan.
- G. Subcontractors: List all materials suppliers, subcontractors and testing laboratories to be used on the project.

1.4 QUALITY ASSURANCE:

- A. Prospective Bidder/Contractors shall attend a pre-bid meeting where the pervious concrete pavement construction process will be described (see Section 1.08) by industry representatives.
- B. Prior to award, the Bidder/Contractor shall submit evidence of two successful pervious concrete pavement projects, each greater than 1,000 ft² (93 m²), including but not limited to the following:
 - 1. Project name and address, owner name and contact information
 - 2. Test results including density (unit weight), void content and thickness. This requirement may be waived by the PW Inspector provided the Bidder/Contractor demonstrates successful experience in the concrete industry and constructs test panel(s) for inspection and testing, per Section 1.06 of this guide.

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- C. Thirty percent (30%) of the crew or at least one member, whichever is greater, shall be certified by the NRMCA Pervious Concrete Contractor Certification program.
- D. Thirty percent (30%) of the crew or at least one member, whichever is greater, shall be certified by the ACI Certified Concrete Flatwork Finisher program.
- E. If the placing contractor and concrete producer have insufficient experience with pervious concrete pavement (less than two successful projects), the placing contractor shall retain an experienced consultant to monitor production, handling, and placement operations at the Contractor's expense.
- F. Qualifications of Testing Laboratories -The testing laboratory shall have its laboratory equipment and procedures inspected at intervals not to exceed 2 years by a qualified national authority as evidence of its competence to perform the required tests and material designs. Acceptable national authority will include the AASHTO Materials Reference Laboratory (AMRL) and/or the Cement and Concrete Reference Laboratory (CCRL) as appropriate. In addition, testing machines and equipment must be calibrated annually or more frequently by impartial means using devices of accuracy traceable to the National Bureau of Standards.
- G. In fields other than those covered by the referenced ASTM standards, the testing laboratory shall accept only those assignments which it is able to perform competently by use of its own personnel and equipment. Any work to be subcontracted must be to laboratories meeting the same criteria.
- H. The testing laboratory shall have demonstrated its competence in the applicable fields for a period of not less than 3 years.
- I. The inspection and testing services of the testing laboratory shall be under the direction of a full-time employee registered as a professional engineer in the State of Utah. He shall have a minimum of 5 years of professional engineering experience in inspection and testing of concrete construction.

1.5 SPECIAL EQUIPMENT:

- A. Pervious concrete requires specific equipment for compaction and jointing. The pervious concrete pavement shall be jointed and compacted using the methods listed, or alternatives as demonstrated and approved by the PW Inspector. For example, large installations may warrant mechanized placement techniques.
- B. Rolling compaction shall be achieved using a steel pipe roller that spans the width of the section placed and exerts a vertical pressure of 10 psi (68.95 kPa) to 30 psi (206.85 kPa) on the concrete, or a hydraulically actuated rotating tube screed.

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- C. Plate compaction (for small areas) shall be achieved using a standard soil plate compactor that has a base area of at least two square feet and exerts a minimum of 10 psi (69 kPa) vertical pressure on the pavement surface (through a temporary cover of 1/4 in. (19 mm) plywood).
- D. When contraction joints are created in pervious pavements, they may be constructed by rolling, forming or sawing. Rolled joints shall be formed using a "pizza cutter roller" to which a beveled fin with a minimum depth of 1/4 the thickness of the slab has been welded around the circumference of a steel roller. Sawed joints shall be constructed using an early entry or wet saw. Note: Sawed joints may exhibit some raveling, and any dust or slurry generated should be removed during the sawing operation.

1.6 TEST PANELS:

- A. Prior to construction, test panel(s) shall be placed, and approved by the PW Inspector. The PW Inspector may waive this requirement based on Contractor qualifications. At Contractor's option, test panels may be constructed and approved sections of project aggregate detention (or groundwater recharge) layer.
- B. Test panel(s) shall be constructed in accordance with the plans and specifications. Regardless of qualification, the Contractor is to place two test panels, each a minimum 225 ft² (20.9 m²) at the required project thickness, consolidated, jointed and cured using materials, equipment, and personnel proposed for the project, to demonstrate to the PW Inspector's satisfaction that in-place unit weights can be achieved and a satisfactory pavement can be installed at the site location.
- C. Test panel(s) cost and removal, if necessary, shall be included as a line item in the contract proposal and contract. Test panels may be placed at any of the specified pervious concrete pavement locations on the project or at another test site.
- D. Quality: Test panels shall have acceptable surface finish, joint details, thickness, porosity and curing procedures and shall comply with the testing and acceptance standards listed in the Quality Control section of this specification. Test panels shall be tested for thickness in accordance with ASTM C 42; void structure in accordance with ASTM C 138 (Gravimetric Air Determination); and for core unit weight in accordance with ASTM C 140, paragraph 6.3.
- E. Satisfactory performance of the test panels shall be determined by:
 - 1. Compacted thickness no less than 1/4 in. (6.35 mm) less than specified thickness ($T_{\text{compacted}} \geq T_{\text{specified}} - 1/4 \text{ in.}$); ($T_{\text{compacted}} > T_{\text{specified}} - 6.35 \text{ mm}$)
 - 2. Void Structure: 15 % minimum; 25 % maximum;
 - 3. Unit weight plus or minus 5 lb/ft³ (80 kg/m³) of the design weight. If measured void structure falls below 15 % or if measured thickness is greater than 1/4 in. (6.35 mm) less than specified thickness or if measured weight falls less than 5 lb/ft³ (80 kg/m³) below unit weight, the test panel shall

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be removed at the Contractor's expense and disposed of in an approved landfill or recycling facility. If test panels are found to be satisfactory, they may be left in place and included in the completed work, at no additional cost to the project.

1.7 PROJECT CONDITIONS

A. Weather Limitations

1. The Contractor shall not place pervious concrete for pavement when the ambient temperature is 40° F (4° C) or lower, unless otherwise permitted in writing by the PW Inspector.
2. The contractor shall not place pervious concrete for pavement when the ambient temperature is 90° F (32° C) or higher, unless otherwise permitted in writing by the PW Inspector.

1.8 PRE-PAVING CONFERENCE

- A. A pre-paving conference with the PW Inspector shall be held within one week prior to beginning placing the pervious concrete. The contractor shall have the pervious concrete supplier, the foreman and the entire concrete crew that will form and place the concrete in attendance at this meeting.
- B. As a guide for the meeting, the document Checklist for the Concrete Pre-Construction Conference (available from the National Ready Mixed Concrete Association or the American Society of Concrete Contractors) shall be used to review all requirements of the contract during the meeting. Meeting emphasis shall be on how paving with pervious concrete differs from paving with conventional concrete.

PART 2 PRODUCTS

2.1 STORMWATER DETENTION LAYER OR GROUNDWATER RECHARGE BED

- A. Testing to determine the subgrade soil infiltration rate shall be conducted by a qualified testing laboratory, by either the field or laboratory methods listed below:
 - Field methods — ASTM D 3385 or ASTM D 5093;
 - Laboratory methods — ASTM D 5084 or ASTM D 2434.
- B. If the subgrade soil has a minimum infiltration rate of 0.5 in./h (12.7 mm/h), a filter fabric may be installed and the stormwater storage used for groundwater recharge. Otherwise an impervious liner shall be installed and a positive outlet provided to drain all water from the storage layer. (Note: Local ordinances may dictate storage and discharge requirements. For this guide specification, if an

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impervious liner is used, the stormwater storage layer is referred to as a detention layer, anticipating that the water will pass from storage via a pipe, daylighted aggregate drain or other form of positive conduit. If a filter fabric is used, the storage layer will be referred to as a recharge bed, anticipating that a substantial amount of the stored water will pass through the fabric into the subgrade.) Note: Sizing and locations of any pipes, etc. is to be designed by others, and is not a part of this guide.

- C. Coarse aggregate for stormwater detention layer (or groundwater recharge bed) shall be 2½ in. to 1½ in. (63 mm to 37.5 mm) uniformly graded crushed coarse aggregate, with a wash loss of no more than 0.5%, AASHTO size No. 2 or approved equal.
- D. Choker base course aggregate for stormwater detention layer (or groundwater recharge bed) shall be 1 in. to No. 4 (25.0 mm to 4.75 mm) uniformly graded, crushed coarse aggregate, with a wash loss of no more than 0.5 %, AASHTO size No. 57, or approved equal.
- E. Actual size(s) of washed, uniformly graded, coarse aggregate for stormwater detention layer (or groundwater recharge bed), shall be at contractor's option for best availability, percent void and economics. Plan thickness requirements for stormwater storage in the system, whether designed for detention or recharge, may be verified using the Pervious Concrete Hydrological Analysis Program.² That software assumes a flat subgrade; calculations may require adjustments for subgrade slope. Even for soils with infiltration rates in excess of 1.5 inches per hour, minimum total thickness of coarse aggregate for stormwater storage shall be 6 in. (152 mm).
- F. Impervious liner — shall be 15 mil Stego Wrap or Permalon, PLY-X 150, or approved equal (for stormwater detention).
- G. Filter fabric - shall be a nonwoven geotextile, Marafi 140N or Typar fabric, style 3341, or approved equal (for groundwater recharge).
- H. Isolation (Expansion) joint material - Isolation joint material shall be gray or black in color, ¼ in. (6.35 mm) or ½ in. (12.7 mm) Proflex Vinyl (Isolation) Expansion Joint by Oscoda Plastics, or equal, in compliance with ASTM D 1751 or ASTM D 1752.
- I. Curing materials
 - 1. Polyethylene sheeting - The primary method of curing pervious concrete shall be the placement of a waterproof covering, consisting of a minimum of 6 mil thick polyethylene sheeting.
 - 2. Other moisture loss control - For prevention of moisture loss prior to the primary method of curing:

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- a. Liquid membrane curing compound complying with ASTM C-309, Type 1, Class A unless other type approved by the PW Inspector, having a moisture loss, when applied at a rate of 200 ft² per gallon (4.9 m² per L) shall not be more than 0.055 gr./sq.cm.; or
- b. Monomolecular film (evaporation retardant), SikaFilm by Sika Corporation, EucoBar by Euclid Chemical Co., Confilm by BASF (Master Builders Technologies) or Catexol Cimfilm by Axim Concrete Technologies, or approved equal, applied per manufacturer's instructions.
- c. Soybean oil scaler is gaining in acceptance and use in certain regions. It reportedly reduces surface color markings from plastic sheeting, may enhance strength and does not reduce porosity.

2.2 PERVIOUS CONCRETE PAVEMENT

- A. Cement: Portland Cement Type I, Type II or V conforming to ASTM C 150 or Portland cement Type IP or IS conforming to ASTM C 595.
- B. Supplementary Cementitious Materials:
 1. Fly ash conforming to ASTM C 618
 2. Ground Granulated Blast-Furnace Slag conforming to ASTM C 989
- C. Admixtures:
 1. Air entraining admixtures with ASTM C 260.
 2. Chemical admixtures shall comply with ASTM C 494.
 - a. Mid-range water reducing admixtures (water reducers) Type A or High Range water reducing admixtures Type F or G are permitted due to low water cementitious ratios specified for pervious concrete.
 - b. Extended set control admixtures (hydration stabilizers) meeting requirements of ASTM C 494 Type B Retarding or Type D Water Reducing/Retarding admixtures are permitted to be used when it is necessary to increase concrete placement time to 90 minutes or to improve finishing operations. This stabilizer suspends cement hydration by forming a protective barrier around the cementitious particles, which delays the particles initial set. If this mix heats up in the truck a standard retarder will not prevent premature hydration where the stabilizer will.
 - c. Viscosity modifying admixtures (VMA's) are permitted to facilitate discharge of the concrete from the truck and placement in the forms.

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- D. Aggregates for pervious concrete:
1. Coarse aggregate shall meet the size and grading requirements as defined in ASTM D 448 (or Standard Sizes of Coarse Aggregate, Table 4, AASHTO Specifications, Part I, 13th Ed., 1982 or later) and shall comply with ASTM C 33 unless an alternate size is approved for use based on meeting the project requirements. Data for proposed alternate material shall be submitted for approval per Section 1.05A of this guide. Fine aggregate complying with ASTM C33, if used, shall not exceed 3 ft³ per yd (0.11 m³ per 1.0 m³).
 2. Larger aggregate sizes may increase porosity but can decrease workability. Well graded aggregates shall be avoided as they may reduce porosity, and may not provide adequate void content.
 3. Where available, natural rounded aggregates are recommended.
- E. Water: Water shall be potable and comply with ASTM C 1602.
- F. Mixture Proportions: The Contractor shall furnish a proposed mix design with proportions of materials prior to commencement of work. The data shall include unit weights determined in accordance with ASTM C 29 paragraph 11, jigging procedure. The composition of the proposed concrete mixture shall be submitted to the PW Inspector for review and/or approval and shall comply with the following provisions unless an alternative composition is demonstrated to comply with the project requirements. Mixture performance will be affected by properties of the particular materials used. Trial mixtures must be tested to establish proper proportions and determine expected behavior. Concrete producers may have mixture proportions for pervious concrete optimized for performance with local materials. Appendix 6 of ACI 211.38 provides a guide for pervious concrete mixture proportioning.
- G. Proportions:
1. Aggregate/cementitious ratio: range of 4:1 to 5:1.
 2. Concrete mixture unit weight: range of 115 lb/ft³ to 130 lb/ft³ (1680 kg/m³ to 3080 kg/ m³) per ASTM C29, paragraph 11, jigging procedure.
 3. Concrete mixture void content: range of 15% to 25%, per ASTM C138, Gravimetric Air Determination.
 4. Cementitious content: range of 500 lbs/yd³ to 600 lb/yd³ (297 kg/ m³ to 356 kg/ m³), total cementitious content.
 5. Supplementary cementitious content: Fly ash: 25% maximum; Slag: 25% maximum, or Combined supplementary cementitious content: 35% maximum.
 6. Water - cementitious ratio: range from 0.30 to 0.37.
 7. Aggregate content: The bulk volume of aggregate per cubic yard (cubic meter) shall be equal to 27 ft³ (1 m³) when calculated from the dry rodded density (unit weight) determined in accordance with ASTM C29 jigging procedure.

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8. **Admixtures:** Admixtures shall be used in accordance with the manufacturer's instructions and recommendations. Dosage of air-entraining admixture shall be a minimum of 2 oz /cwt (130 mL/100kg) of cementitious material.
9. **Mix Water:** The quantity of mixing water shall be established to produce a pervious concrete mixture of the desirable workability to facilitate placing, compaction and finishing to the desired surface characteristics. Mix water shall be such that the cement paste displays a wet metallic sheen without causing the paste to flow from the aggregate. (A cement paste with a dull-dry appearance has insufficient mix water for hydration.) Insufficient mix water results in inconsistency in the mix and poor bond strength. High water content results in the paste sealing the void system primarily at the bottom and poor surface bond.

PART 3 EXECUTION

The PW Inspector shall be notified at least 24 hours prior to all detention layer (or recharge bed) placement and pervious concrete paving work.

3.1 STORMWATER DETENTION LAYER

- A. **Subgrade Preparation.** Existing subgrade under detention layer areas shall be shaped to drain and compacted per plan lines, grades and specifications.
- B. **Detention Layer Installation.** Upon completion of subgrade work, the PW Inspector shall be notified and shall inspect at his discretion before proceeding with detention layer installation.
 1. Impervious liner, with pipe or other storage devices, and detention layer aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of impervious liner at the contractor's expense.
 2. Place impervious liner in accordance with manufacturer's standards and recommendations, including overlap width of adjacent strips. Secure liner to walls of detention layer excavation and take steps necessary to prevent any runoff or sediment from entering the detention layer excavation. For protection of existing adjacent building foundations, place impervious liner extending 6 ft (1.83 m) beyond toe of slope face at building face, secure as recommended by manufacturer.
 3. Install coarse aggregate in 6 in. (152 mm) maximum lifts. Lightly compact each layer with equipment, keeping equipment movement over detention layer subgrade to a minimum. Install aggregate to grades required on the plans.

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4. Install 1 in. (25 mm) nominal thickness of choker base course size No.57 (AASHTO) aggregate evenly over surface of stone bed, sufficient to allow placement of pavement, and notify the PW Inspector for approval.
- C. Following placement of detention layer aggregate, the impervious liner shall be folded back along all excavation edges to protect from sediment washout along excavation edges. At least a 2 ft (610 mm) strip shall be used to protect the detention layer from adjacent bare soil. This edge strip shall remain in place until all bare soils contiguous to detention layer are stabilized and vegetated. In addition, hay bales shall be placed at the toe of slopes which may be adjacent to detention layers to further prevent sediment from washing into the detention layers during site development. As the site is fully stabilized, excess impervious liner along the detention layer edges can be cut back to coarse aggregate edge.

3.2 GROUNDWATER RECHARGE BED

- i. Subgrade Preparation (a flat subgrade is preferred for a recharge bed). Existing subgrade under recharge bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to coarse aggregate bed placement.
 1. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 in. (152 mm) with a York rake or equivalent and light tractor.
 2. Bring subgrade of coarse aggregate recharge bed to line, grade, and elevations required.
 3. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of coarse aggregate.

3.3 RECHARGE BED INSTALLATION

- A. Upon completion of subgrade preparation, the PW Inspector shall be notified and shall inspect at his discretion before the contractor may proceed with recharge bed installation.
- B. Filter fabric, with pipe or any other storage devices, and recharge bed aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of filter fabric at the contractor's expense.
- C. Place filter fabric in accordance with manufacturer's standards and recommendations. Adjacent strips of filter fabric shall overlap a minimum of 16 in. (406 mm). The contractor shall secure fabric at least 2 ft (610 mm) outside of bed and take steps necessary to prevent any runoff or sediment from entering the storage bed. For protection of existing adjacent building foundations, the

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contractor shall place impervious liner over filter fabric extending 6 ft (1829 mm) beyond toe of slope face at building face, and secure as recommended by manufacturer.

- D. Install coarse aggregate in 6 in. (152 mm) maximum lifts. Lightly compact each layer with equipment, keeping equipment movement over storage bed subgrades to a minimum. Install aggregate to grades required on the drawings.
- E. Install 1 in. (25 mm) nominal thickness choker base course size No. 57 (AASHTO) aggregate evenly over surface of stone bed, sufficient to allow placement of pavement, and notify the PW Inspector for approval.
- F. Following placement of bed aggregate, the filter fabric shall be folded back along all bed edges to protect from sediment washout along bed edges. At least a 2 ft (610 mm) strip shall be used to protect beds from adjacent bare soil. This edge strip shall remain in place until all bare soils contiguous to beds are stabilized and vegetated. In addition, hay bales shall be placed at the toe of slopes which may be adjacent to beds to further prevent sediment from washing into beds during site development. As the site is fully stabilized, excess filter fabric along the bed edges can be cut back to coarse aggregate edge.

3.4 PERVIOUS CONCRETE PAVEMENT

- A. Pavement Thickness: Pavement thickness for all applications (excluding heavy traffic loads) shall be single-course placement 6 in. (152 mm) thick unless otherwise specified in the plans. Pavements for vehicles heavier than single axle service/delivery trucks will require special design thicknesses which may require two-course construction.

3.5 FORMWORK

- A. Form materials are permitted to be of wood or steel and shall be the full depth of the pavement. Caution: protect impermeable membranes from puncture or tear when placing forms and form pins. Forms shall be of sufficient strength and stability to support mechanical equipment without deformation of plan profiles following spreading, strike-off and compaction operations. Forms may have a removable spacer of ½ in. to ¾ in. (13 mm to 19 mm) thickness placed above the depth of pavement. The spacers shall be removed following placement and vibratory strike-off to allow roller compaction. (Removable spacers may not be necessary if other means of strike-off and consolidation are used, such as a hydraulically actuated pipe roller screed.)
- B. The Contractor will be restricted to pavement placement widths of a maximum of 19 ft (5.8 m) [Note: Parking stall area is typically 19 feet (5.8 m) wide.], unless the Contractor can demonstrate competence to provide pavement placement widths greater than the maximum specified to the satisfaction of the PW Inspector. Large

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scale mechanized placement of pervious concrete with slip form concrete paving machines or asphalt paving machines may preclude use of fixed forms.

3.6 MIXING AND HAULING

- A. Production: Pervious concrete shall be manufactured and delivered in accordance with ASTM C 94.
- B. Mixing: Mixtures shall be produced in central mixers or in transit (truck) mixers. When concrete is delivered in agitating or non-agitating units, the concrete shall be mixed in the central mixer for a minimum of 1.0 minute or until a homogenous mix is achieved. Concrete mixed in transit mixers shall be mixed at the speed designated as mixing speed by the manufacturer for 75 - 100 revolutions.
- C. Transportation: The pervious concrete mixture may be transported or mixed on site and discharge of individual loads shall be completed within one (1) hour of the introduction of mix water to the cement. Delivery times may be extended to 90 minutes when a hydration stabilizer is used.
- D. Discharge: Each truckload shall be visually inspected for consistency of concrete mixture. Water addition shall be permitted at the point of discharge to obtain the required mix consistency, provided a measurable quantity is discharged, and provided no more than 0.5 yd³ (0.4 m³) of concrete has been discharged. A minimum of 30 revolutions at the manufacturer's designated mixing speed shall be counted following the addition of any water to the mix, prior to further discharge. Discharge shall be a continuous operation and shall be completed as quickly as possible. Concrete shall be deposited as close to its final position as practical and such that discharged concrete is incorporated into previously placed plastic concrete. If consolidation occurs during concrete discharge, placement shall be halted and wet concrete removed (this may happen towards the end of some loads).

3.7 PLACING AND FINISHING

- A. Prior to placing concrete, the subbase shall be soaked and in a wet condition at time of placement. Failure to provide a moist subbase will result in a reduction in strength of the pavement.
- B. Concrete may be deposited into the forms by mixer truck chute, conveyor or buggy.
- C. Unless otherwise permitted, the Contractor shall utilize a mechanical vibratory screed to strike off the concrete ½ in. to ¾ in. (13 mm to 19 mm) above final height, utilizing the form spacers described in Formwork. An alternative method to strike off and compact the concrete is to use a hydraulically actuated pipe roller screed as described under 1.04 Special Equipment. If approved by the PW Inspector in writing, the Contractor may place the pervious concrete with either

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slip form or vibratory form riding equipment with a following compactive unit that will provide a minimum of 10 psi (69 kPa) vertical force to the concrete. Similarly, strike off by hand straightedge may be permitted for sidewalks and other small areas followed by compaction.

- D. Care must be taken to prevent closing the void structure of pervious concrete. After mechanical or other approved strike-off and compaction operation, no other finishing operation will be allowed. Internal vibration shall not be permitted. If vibration, internal or surface applied, is used, it shall be shut off immediately when forward progress is halted for any reason.
- E. Placed concrete shall not be disturbed while in the plastic state. Low spots after the screeding operation shall be over-filled for surface repair and tamped to desired elevation with hand tampers.
- F. Following strike-off, remove spacers and compact the concrete to the form level, utilizing a steel roller, a plate compactor on plywood or other method approved by the PW Inspector. Longitudinal rolling shall be followed immediately by cross rolling and joint rolling (if specified). Care shall be taken during compaction that sufficient compactive force is achieved without excessively working the concrete surface that might result in sealing off the surface porosity.
- G. Hand tampers and an edging tool with $\frac{1}{4}$ in. (6 mm) radius shall be used to compact the concrete along the slab edges immediately adjacent to the forms. After compaction, inspection and surface repair, no further finishing shall be performed on the concrete. Surface curing shall begin immediately.
- H. The pervious concrete pavement shall be compacted to the required cross-section and shall not deviate more than $\pm 3/8$ in. in 10 ft (± 9 mm in 3 m) from profile grade.

3.8 JOINTING

- A. Joints in pervious pavements can be precluded at the option of the owner, who may, instead, choose to accept or prefer the appearance of random cracking.
- B. Although longer joint spacings may control cracking, for conservative design, contraction (control) joints shall be installed at regular intervals not to exceed 15 ft (4.6 m), and slab length shall not exceed $1\frac{1}{2}$ times the width of the slab. Transverse contraction joints shall be installed at $\frac{1}{4}$ the depth of the thickness of the pavement. These joints can be installed in the plastic concrete or saw cut after the concrete has hardened.
- C. Jointing plastic concrete: Joints installed in the plastic concrete may be constructed utilizing a small roller as described in the Special Equipment section of this guide

SECTION 5: STANDARD SPECIFICATIONS

specification. When this option is used it shall be performed immediately after roller compaction and prior to curing.

- D. Jointing hardened concrete: Saw-cuts shall be made as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking, Early entry sawing occurs later with pervious concrete than with conventional concrete. For either method, the curing cover shall be temporarily removed and the surface kept misted to prevent moisture loss during sawing. Sawdust or slurry shall be promptly removed to protect the pervious concrete pores. After sawing, the curing cover shall be securely replaced for the remainder of the curing cycle.
- E. Transverse construction joints: Transverse construction joints shall be installed whenever placing is suspended for 30 minutes or whenever concrete is no longer workable.
- F. Isolation joints: Isolation joints shall be used when abutting fixed vertical structures such as light pole bases, building foundations, etc.
- G. Edging, using a tool with $\frac{1}{4}$ in. (6 mm) radius, and additional compaction with hand tamping tools shall be performed along all form lines and along all isolation joints and construction joints to reduce potential for raveling under traffic.

3.9 CURING

- A. Curing procedures shall begin immediately, no later than 20 minutes, from the time the pervious concrete is discharged from the truck. Placing, finishing and tooled jointing and edging must be completed within the 20-minute window from discharge. The pavement surface shall be covered with a minimum of 6 mil thick polyethylene sheet or other approved covering material. Prior to covering, an evaporative reducer shall be sprayed above the surface when required due to ambient conditions (high temperature, high wind, and low humidity). The cover shall overlap all exposed edges and shall be secured (without using dirt or stone) to prevent dislocation due to winds or adjacent traffic conditions. For additional guidance on hot weather concreting, see ACI 305, and for cold weather concreting see ACI 306.
- B. The low water/cementitious ratio and high amount of exposed surface of pervious concrete make it especially susceptible to drying out. Immediately after screeding, the surface shall be kept moist and evaporation prevented using a spray applied curing compound and/or evaporation retarder immediately after screeding. Immediately after each transverse jointing the polyethylene sheet curing shall be applied then cross rolling shall be performed.
- C. The curing cover shall remain securely in place for a minimum of 7 days, uninterrupted. No vehicular traffic shall be permitted on the pavement until curing is complete (7 days) and no truck traffic shall be permitted for at least 14 days.

SECTION 5: STANDARD SPECIFICATIONS

Pedestrian traffic may be permitted on the curing concrete after 24 hours. The PW Inspector may permit earlier traffic opening times.

3.10 QUALITY CONTROL – CONCRETE

- A. The PW Inspector shall employ a testing laboratory that conforms to the requirements of ASTM E329 and ASTM C1077. All personnel engaged in concrete testing shall be certified by the American Concrete Institute as ACI Concrete Field Technicians or equivalent.
- B. Traditional concrete testing procedures for strength and slump control are not applicable to this type of pavement material. Procedures to be used per this guide specification include: ASTM C 172, ASTM C 29, ASTM C 42 and ASTM C 138.
- C. Concrete tests shall be performed for each 150 yd³ (115 m³) or fraction thereof with a minimum of one set of tests for each day's placement.
- D. Sampling - Plastic concrete shall be sampled in accordance with ASTM C 172.
- E. Unit weight (Density) — Unit weight shall be measured in accordance with ASTM C 29. The measure is to be filled and compacted in accordance with ASTM C 29 paragraph II, jiggling procedure. The unit weight of the delivered concrete shall be +/- 5 lb/ft³ (80 kg/ m³) of the design unit weight (density).
- F. Void content - Void content of the plastic concrete shall be calculated as per ASTM C138 (Gravimetric Air Determination), and compared to the void percentage required by the hydraulic design. Unless otherwise specified, void content shall be between 15% and 25%.
- G. After a minimum of seven (7) days, hardened concrete shall be tested at a rate of one set of three cores per 150 yd³ (115 m³) of concrete placed on one day or fraction thereof. Cores shall be drilled in accordance with ASTM C 42. The cores shall be measured for thickness, void structure and unit weight.
- H. Thickness - Untrimmed hardened core samples shall be used to determine placement thickness. The average of all production cores when measured for length shall not be more than ½ in. (13 mm) less than the specified design thickness.
- I. Core unit weight (density) and void content - The cores shall be tested for unit weight (density) and void content using ASTM C 140. Unit weight (density) of cores trimmed and tested in the saturated condition, per ASTM C 140 paragraph 6.3.1, shall be +/- 5 lb/ft³ (80 kg/m³) of the design unit weight. Void content shall not be lower than 2% below the specified design void content. Void content shall be calculated as follows:

SECTION 5: STANDARD SPECIFICATIONS

$\% \text{ Voids} = 1 - (Dd/Di)$
100 where: Dd = oven dried
density of core Di = immersed density of core

3.11 BASIS OF PAYMENT

- A. Pervious concrete pavement shall be paid for based on the square yards or square feet (square meters) of in-place product including materials and labor, thickness, and void content.

3.12 PERFORMANCE/MAINTENANCE

- A. Excessive raveling - At or before 28 days after placement, any areas of excessive surface raveling, as determined by the PW Inspector, shall be removed and replaced or repaired by the Contractor, [optional language - a) at the unit price established in the contract; or b) at no additional cost to the project].
- B. Surface drainage - At or before 28 days after placement, any areas of insufficient surface porosity, as determined by the PW Inspector, shall be removed and replaced by the Contractor, [optional language — a) at the unit price established in the contract; or b) at no additional cost to the project].
- C. Maintenance - At or before 28 days after placement, the contractor shall submit to the PW Inspector a written maintenance plan to prevent the clogging of the pervious concrete pavement. The plan shall include periodic testing for porosity and methods to restore porosity if the rate drops below 75% of the original rate. Acceptable methods to restore levels of porosity are either to vacuum or power wash the pervious concrete sections. Fee for preparation of the maintenance plan shall be [optional language - a) at the unit price established in the contract; or b) at no additional cost to the project].

SECTION 32 16 13 DRIVEWAY, SIDEWALK, CURB, GUTTER

PART 3 EXECUTION

3.5 CONTRACTION JOINTS

- C. Curb, Gutter, Waterway

Revise subparagraph 1 to read as follows:

1. Place joints at intervals not exceeding 10 feet.

SECTION 5: STANDARD SPECIFICATIONS

**SECTION 32 31 13
CHAIN LINK FENCES AND GATES**

PART 2 PRODUCTS

2.1 GENERAL

Amend paragraph C to read as follows:

- C. Polyvinyl Chloride (PVC): With PVC coated materials, paint all fittings, hardware and accessories as indicated to match PVC color. The fabric shall be hot dipped galvanized steel wire complying with ASTM A 392 and coated with a continuous PVC bonding process (minimum 15 mil thickness) in accordance with ASTM F 668. The posts shall be schedule 40 hot dipped galvanized steel coated with a continuous PVC bonding process (minimum 15 mil thickness) in accordance with ASTM F 668. Color of PVC coating shall be as indicated and applied free of voids, cracks, tears and shall have a smooth and lustrous surface.

2.3 BARBED WIRE

Amend paragraph A to read as follows:

- A. Three strand, two wires per strand, 12-1/2 gage wire with 14 gage, 4 point round barbs spaced approximately 5-inches on center. Barbed wire shall be zinc (galvanized) coated.

2.6 POSTS, CAPS, RAILS, COUPLINGS

Amend Table 1 to read as follows:

Table 1 - Posts, Frames, Stiffeners, Rails	
Proposed Use	Nominal Type and Size
End, corner, slope and gate posts for single gates 6-feet or less in width and double gates 12-feet or less in width for fence less than 72-inches high	2" pipe
End, corner, slope and gate posts for single gates 6-feet or less in width and double gates 12-feet or less in width for fence 72-inches or higher	2-1/2" pipe
Gate posts for single swing gates over 6-feet, but not over 13-feet in width and double swing gates over 12-feet, but not over 26-feet in width or for all slide gates with leaves larger than 6-feet	3-1/2" pipe
Gate posts for single swing gates over 13-feet, but not over 18-feet in width and double swing gates over 26-feet, but not over 36-feet width	6" pipe
Gate posts for single swing gates over 18-feet in width and double swing gates over 36-feet in width	8" pipe
Frame for gates	1-1/2" pipe
Stiffeners for gates	1-1/4" pipe

SECTION 5: STANDARD SPECIFICATIONS

Table 1 - Posts, Frames, Stiffeners, Rails	
Proposed Use	Nominal Type and Size
Line posts for fences 72-inches high or higher	2" pipe
Line posts for fences less than 72-inches high	1-1/2" pipe
Top rail	1-5/8" pipe
Bottom rail	6-gage, coiled spring steel tension wire

Amend paragraph C to read as follows:

- C. Caps: Pressed galvanized steel or malleable iron designed to fit securely over post ends forming a weather tight closure. Where top rail is used, provide cap to permit passage of top rail.

2.8 SUPPORT OR EXTENSION ARM

Add paragraph D and E as follows:

- D. Extension arms for gate and other fence posts shall be fabricated from galvanized steel.
- E. Gate posts shall be provided with vertical extension arms while all other posts shall have 45° angle extension arms.

2.9 GATES

Add paragraph E as follows:

- E. Gates shall be provided with an appropriate catch and locking attachment. Double swing gates shall be provided with a center rest and catch mechanism. Stops shall be provided to hold gates open.

PART 3 EXECUTION

3.3 INSTALLATION OF POSTS

Amend paragraph D to read as follows:

- D. Minimum diameter of the concrete bases shall be the diameter of the post plus 10-inches. The post shall be centered in the concrete base. Concrete shall be wet set; no dry mix shall be used. Place a minimum of 6-inches concrete below each post. Concrete shall be finished with a minimum of 1-inch of concrete left above finish grade in all directions to allow water to drain away from the post. Depth of post in concrete as follows:

Line Posts: 18-inches

SECTION 5: STANDARD SPECIFICATIONS

SECTION 32 31 16 WELDED WIRE FENCES AND GATES

PART 2 PRODUCTS

2.1 GENERAL

Amend paragraph C to read as follows:

- C. Polyvinyl Chloride (PVC): With PVC coated materials, paint all fittings, hardware and accessories as indicated to match PVC color. The fabric shall be hot dipped galvanized steel wire complying with ASTM A 392 and coated with a continuous PVC bonding process (minimum 15 mil thickness) in accordance with ASTM F 668. The posts shall be schedule 40 hot dipped galvanized steel coated with a continuous PVC bonding process (minimum 15 mil thickness) in accordance with ASTM F 668. Color of PVC coating shall be as indicated and applied free of voids, cracks, tears and shall have a smooth and lustrous surface.

2.3 BARBED WIRE

Amend paragraph A to read as follows:

- A. Two wire per strand, 12-1/2 gage wire with 14 gage, 4 point round barbs spaced approximately 5-inches on center. Barbed wire shall be zinc (galvanized) coated. Number of strands as called for on the drawings.

2.4 UNTREATED WOOD POSTS FOR LINES, GATES, ENDS, AND CORNERS

Amend paragraph A to read as follows:

- A. Line Posts: 10-inches minimum circumference Juniper or acceptable alternative approved by ENGINEER. Rectangular line posts shall have a minimum cross section area of 12-inches square. Square members may be rough sawn or finished.

2.5 TREATED WOOD POSTS AND WOOD BRACE RAILS

Add paragraph E to read as follows:

- E. If the treated surface of a post has been disturbed or damaged in handling or installation, the exposed, untreated wood shall receive a minimum of two coats of the same compound with which the post was originally treated.

2.7 TUBULAR STEEL FRAME GATE WITH WIRE FABRIC

Amend paragraph A to read as follows:

- A. Gate frames manufactured with steel pipe. 1-inch nominal diameter minimum steel pipe. Frames shall have caps or seals to cover the open ends of square corners of gate frames.

SECTION 5: STANDARD SPECIFICATIONS

PART 3 EXECUTION

3.2 INSTALLATION

Amend paragraph D to read as follows:

- D. Set metal, corner, end, gate, and brace posts in concrete footings that are 12-inches larger in diameter than the post and at least 30-inches deep. Concrete shall be finished with a minimum of 1-inch of concrete left above finish grade in all directions to allow water to drain away from the post. Install no materials on posts or place strain on guys until 7-days after placing concrete.

Amend paragraph L to read as follows:

- L. Construct gates to operate freely without sag. Provide fabric, fittings and locks.

Add paragraphs N, O, and P to read as follows:

- N. Barbed wire fencing shall be constructed of 4-strands of wire. Construction of 4-strand barbed wire fencing shall require 6-foot posts. Install barbed wire on the inside of the post, away from traffic.
- O. At sag sections, or at points of vertical alignment change in concrete foundations, set braced posts at least 30-inches into the ground for 6-foot posts. Place a minimum 3-inch concrete base below each brace post. Concrete shall be minimum 18-inches in diameter. Expose 1-inch of concrete above the finished grade, finish off and slope to drain away from the post. Backfill and compact posts.
- P. Wire mesh fabric shall be of the width indicated in the Contract Documents. Install fence fabric on the inside of the post, away from traffic. Remove all sags from wire mesh without causing tension crimps to fail.

DIVISION 33 UTILITIES

SECTION 33 05 03 COPPER PIPE

PART 2 PRODUCTS

2.2 CONNECTIONS

Revise paragraph A to read as follows:

- A. Compression only.

SECTION 5: STANDARD SPECIFICATIONS

SECTION 33 05 06 POLYETHYLENE PIPE

PART 2 PRODUCTS

Add Article 2.4 as follows:

2.4 HDPE (High Density Polyethylene) PIPE

- A. Material: AASHTO M-252 & M-294 corrugated polyethylene pipe, solid or perforated. Smooth inner wall Type S, 4-inches to 24-inches inside diameter.
 - 1. 4-inches to 10-inches inside diameter meeting AASHTO M-252, and 12-inches to 24-inches inside diameter meeting AASHTO M-294.
 - 2. The appropriate material specification to be embossed on the pipe every 10 feet.
 - 3. Slots or perforations shall be in corrugation valleys only and should be clean and free of burrs.
- B. Fittings: Separate couplings and fittings should be marked with pipe manufacturer name or logo. Tape shall not be used to join pipe sections unless intended for temporary use and then only as approved by ENGINEER.
- C. Joint: Joints specified to have gaskets per ASTM F-477 have a rubber gasket seated in a groove on the spigot end. Foam-type weather stripping material is not in compliance.

PART 3 EXECUTION

3.1 INSTALLATION

Add paragraph F as follows:

- F. Installation of HDPE pipe shall be as follows:
 - 1. HDPE corrugated pipe is lightweight which makes handling easy. However, it can be shifted laterally in the trench or may float if not held in place with soil or other methods.
 - 2. The pipe depends on a combination of pipe stiffness and select and common backfill strength to perform as a structure. Select material in the pipe zone should be compacted to at least 90% in non-traffic easement areas and 95% in traffic areas and should contain no particles which do not comply with the gradation of untreated base course.
 - 3. Heavy construction equipment (H-20 axle loads) should not be permitted to pass over the pipe unless a minimum of 2-feet of well compacted soil or gravel is covering the pipe.
 - 4. High-energy compactors such as Hydro-Hammers should not be used until the pipe is covered by at least 4-feet of soil.

SECTION 5: STANDARD SPECIFICATIONS

5. In the absence of a special provision provided by the OWNER, use ASTM D-2321 as a recommended installation guide.
6. To ensure adequate compaction in the haunches, lift thickness prior to compaction from the bedding to the pipe spring line shall not exceed 4-inches.

SECTION 33 05 20 BACKFILLING TRENCHES

PART 2 PRODUCTS

2.1 BACKFILL MATERIALS

Revise paragraph A to read as follows:

- A. Common fill; Section 31 05 13. Sand is prohibited for use as backfill material in the pipe zone or trench above the pipe zone. Sand may be used immediately adjacent to some pipes and/or pipe coverings requiring protection from damage which may be caused by larger aggregate backfill materials. An exception to this prohibition may be granted by the ENGINEER if adjacent native materials consist entirely of a sandy material as defined by Section 31 05 13 2.7. Common fill used as backfill material must be granular composition, non-expansive, well graded material containing a wide range of sizes and possessing the qualities necessary to meet the specified compaction requirements. Common fill used as bedding material must be granular composition, non-expansive, well graded material possessing the qualities necessary to meet the specified compaction requirements.

Revise paragraph B to read as follows:

- B. Common fill; Section 31 05 13. Pea Gravel and Squeegee material are prohibited for use as backfill material in the pipe zone or trench above the pipe zone. Exceptions to this prohibition may be granted by the ENGINEER. Select fill used as backfill material must be granular composition, non-expansive, well graded material containing a wide range of sizes and possessing the qualities necessary to meet the specified compaction requirements. Common fill used as bedding material must be granular composition, non-expansive, well graded material possessing the qualities necessary to meet the specified compaction requirements.

2.2 ACCESSORIES

- C. Identification Tape: Permanent, brightly colored, continuously printed magnetic plastic tape intended for direct burial service; not less than 6-inches wide by 4 mils thick. The tape shall read "CAUTION: BURIED INSTALLATION BELOW". Color of tape as follows:

SECTION 5: STANDARD SPECIFICATIONS

Amend subparagraph 4 to read as follows:

4. Blue: Potable water. Installed 12-inches to 18-inches vertically above the centerline of the potable water lines.

Add paragraph D to read as follows:

- D. Tracer Wire: Required for all installations potable water lines.
 1. Tracer wire shall be installed above and in immediate contact with the pipe and along the pipe centerline. Tracer wire shall be attached to the pipeline to minimize movement during the backfill process. Attachments shall be by means of zip ties at 10 foot increments.
 2. Tracer wire shall be extended to and rise to the surface with valve box installation.
 3. An additional 12-inch loop shall be added at each end of the tracer wire to allow slack for adjustments in road elevation.
 4. S curves in the tracer wire, equal to the diameter of the pipe, shall be installed at each bell to allow the wire to be moved during tapping or other maintenance or repair work on the water line. When the pipe consists of a continuous material lacking joints or bells, provide S curves at 10-foot increments.

PART 3 EXECUTION

3.3 PIPE ZONE

Add paragraph E as follows:

- E. Tracer wire shall be installed in the pipe zone directly above the pipe centerline and in contact with the pipe for all installations of potable water lines. Tracer wire shall be attached to the pipeline to minimize movement during backfill process. Attachments shall be by means of zip ties or tape at 10 foot increments.

3.4 TRENCH ABOVE PIPE ZONE

Revise paragraph D to read as follows:

- D. Install continuous identification tape directly over buried lines 12-inches to 18-inches above the top of pipe.

SECTION 33 08 00 COMMISSIONING OF WATER UTILITIES

PART 1 GENERAL

1.2 REFERENCES

Add paragraph B to read as follows:

- B. ANSI/NSF 60: Drinking Water Treatment Chemicals.

SECTION 5: STANDARD SPECIFICATIONS

1.3 SUBMITTALS

Modify subparagraph A.5 to read as follows:

5. Video cassette and log of visual examination. CONTRACTOR shall provide said video inspection which shall include the actual footage of the line being inspected and shall be accomplished by an independent party approved by the ENGINEER at no additional cost to the OWNER.

PART 2 PRODUCTS

Add article 2.2 to read as follows:

2.2 DISINFECTANTS

- A. All chemicals used in performing the disinfection test shall conform to ANSI/NSF 60. Chemical containers shall bear the ANSI/NSF 60 certification mark.

PART 3 EXECUTION

3.1 PREPARATION

Revise paragraph C to read as follows:

- C. Remove debris, sediment and/or other material from installed pipe prior to testing, leaving pipe in a clean manner. All material collected shall be removed from pipe prior to connecting to existing piping system. Do not discharge or flush sand, gravel, concrete, debris or other foreign material into existing pipeline system. Flushing with clean water only will be allowed but with minimal flows to eliminate exceeding capacities of the existing gravity systems. Flushing into existing pressurized water systems will not be allowed.

3.2 ALIGNMENT AND GRADE TEST

Add paragraph D as follows:

- D. No deflection will be allowed with pipe. Deflection shall be made with the use of pipe fittings.

3.3 PRESSURE TEST

Replace paragraph A as follows:

- A. Air Test: The low pressure air test shall be conducted by the following method under the direction of the ENGINEER:
 1. All wyes, tees, or ends of lateral stubs shall be suitably capped and braced to withstand the internal test pressures. Caps shall be easily removable for future lateral connections or extensions.
 2. After manhole-to-manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs. One of the

SECTION 5: STANDARD SPECIFICATIONS

plugs shall have three hose connections. Air for inflation of the triple connection pneumatic plug shall be supplied through a factory-equipped control panel. There shall be three hose connections from the control panel to the pneumatic plug. The second hose shall be used for continuous reading of the air pressure in the sealed line. The third hose shall be used for introducing low pressure air into the sealed line.

3. There shall be a 3.5-inch or larger diameter, 0.30 psig gauge for reading of the internal pressure in the line being tested. Calibrations from the 0-10 psig range shall be in tenths of pounds and the 0-10 psig portion shall cover 90 percent of the complete dial range.
4. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any groundwater that may be over the pipe. Groundwater's contribution to the head pressure shall be at a rate of 0.433 psig per foot of head. At least 2 minutes shall be allowed for the air pressure to stabilize. After the stabilization period (3.5 psig minimum pressure in the pipe), the third hose shall be disconnected from the control panel.
5. The pipe and joints shall be considered acceptable when the time required in minutes for pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any groundwater that may be over the pipe) shall not be less than the time shown for the given diameters in the follow table:

Pipe Diameter (inch)	Minutes
4	2.0
6	3.0
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5

6. If the installation fails to meet these requirements, the CONTRACTOR shall determine at his own expense the source of leakage and shall repair or replace all defective materials and/or workmanship.

Replace paragraph B as follows:

B. Hydrostatic Test:

1. **Pressure Test:** All newly laid pipe segments and their valves, unless otherwise specified, shall be subjected to a hydrostatic pressure test of 50 lbs or 200 psi above working pressure, whichever is higher. The

SECTION 5: STANDARD SPECIFICATIONS

- hydrostatic pressure test shall be conducted after the pipe segments have been partially backfilled.
2. Duration of Pressure Test: The duration of each hydrostatic pressure test shall be at least two (2) hours.
 3. Test Procedure: Each pipe segment shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a satisfactory manner. Testing against closed valves will be allowed. The pump, pipe connection and all necessary apparatus including gauges and meters shall be furnished by the CONTRACTOR. CONTRACTOR shall provide all labor and equipment necessary to perform the test.
 4. Expelling Air Before Test: Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, air release mechanisms shall be installed, if necessary, at points of highest elevation, and afterwards tightly capped.
 5. Examination Under Pressure: All pipes, fittings, valves, hydrants, joints and other hardware will be subject to examination under pressure during the hydrostatic test. Any defective pipes, fittings, hydrants, valves or other hardware discovered in consequence of this pressure test shall be removed and replaced by the CONTRACTOR with sound material, at no expense to the OWNER, and the test shall be repeated until the ENGINEER is satisfied.
 6. No piping installation will be acceptable until the leakage is less than the amount allowed by industry standards for the type of pipe material being tested. Or, if no standard prevails, than the number of gallons per hour is determined by the formula:

$$Q = [LD \times P^{1/2}] / 133,200$$

Where: Q = allowable leakage, gallons per hour
L = length of pipe under test, feet
D = diameter of pipe, inches
P = average test pressure, psig.

Revise Article 3.4 in its entirety to read as follows:

3.4 OBSTRUCTION TEST

- A. Visually examine pipe internally for obstructions, reductions in pipe shape, grade, infiltration and required lateral connections by means of a closed circuit televised recording. Said inspection shall be by closed circuit video inspection of the completed section or sections and shall log the location of all service taps and problems areas which shall include the actual footage of the line being inspected. Videotape shall become the property of Herriman City. Any defective workmanship indicated by video inspection shall be repaired by the CONTRACTOR at no expense to the OWNER.

SECTION 5: STANDARD SPECIFICATIONS

- B. Prior to commencement of obstruction test, the pipe must be water flushed to clean and remove all debris. All debris must be trapped on a screen and/or blocked and removed from the downstream manhole and not allowed to enter the existing piping network.
- C. When a visual test is not feasible, and when approved by the ENGINEER, a round, incompressible mandrel shall be passed through the pipeline. The diameter of the mandrel shall be 1-inch less than the inside diameter of the pipeline and the length of the mandrel shall be twice the diameter of the pipeline.

3.6 PIPE TESTING SCHEDULE

- B. Irrigation – Pressure System:

Add subparagraph 4 as follows:

- 4. Obstruction Test (See Article 3.4).

- C. Sanitary Sewers:

Add subparagraph 6 as follows:

- 6. Pressure Test (See Article 3.3).

- F. Potable Water System:

Add subparagraph 3 as follows:

- 3. Disinfection Test (See Article 3.7).

Add Article 3.7 as follows:

3.7 DISINFECTION TEST

- A. The disinfection test shall be performed by the City at the CONTRACTOR's expense. Each test will be \$20.00. CONTRACTOR shall perform any necessary excavation and subsequent backfilling at no additional cost to the OWNER.
- B. The new water line shall be disinfected by chlorination. All work and materials necessary to perform this function will be furnished by CONTRACTOR. The CONTRACTOR will be responsible for all related costs and fees related to the chlorination of the completed water line. This test shall be performed prior to connection of the new water lines to the existing Herriman City culinary water system. The CONTRACTOR shall notify OWNER at least 24 hours before the chlorination is scheduled. All valves to remain closed until return of test.
- C. The City will notify contractor of any B.T. results.
- D. All flushing must be metered.

SECTION 5: STANDARD SPECIFICATIONS

**SECTION 331100
WATER DISTRIBUTION AND TRANSMISSION**

PART 1 GENERAL

1.1 SECTION INCLUDES

Amend paragraph A to read as follows:

- A. Water distribution and transmission system identification, valves, backflow prevention devices, boxes, service connections and accessories.

1.2 REFERENCES

Add paragraph H, I and J as follows:

- H. AWWA M14: AWWA Recommended Practice for Backflow Prevention and Cross-Connection Control.

- I. AWWA C909: AWWA Standard for Molecularly Oriented Polyvinyl Chloride (PVC0) Pressure Pipe (ULTRA BLUE), 4 In. through 12 In. for Water.

- J. ANSI/NSF 61: Drinking Water System Components – Health Effects

PART 2 PRODUCTS

2.6 TAPPING SADDLES

Add paragraphs C, D and E as follows:

- C. CONTRACTOR provided tapping saddles (sizes less than 2-inches) shall be FORD FB202B or MUELLER double strap saddle, model BR2B.

- D. Tapping saddles for sizes 3-inches and greater shall be ROMAC 557, Smith Blair JCM with flange by MJ Valve.

- E. Meter setters shall be FORD VBHC72-95581-01 or AY Mc Donald 21-218DWZZ with dual check valve.

2.7 SERVICE CONNECTIONS

Replace paragraph A with the following:

- A. IPS Polyethylene Pipe per 33 05 06 with compression type 200 psi fittings in accordance with AWWA C800.

Add paragraph B as follows:

- B. All pipe fittings, valves, or other components that will come into contact with drinking water shall conform to ANSI/NSF 61, and shall bear either the ANSI/NSF 61 or ANSI/NSF-pw certification mark.

SECTION 5: STANDARD SPECIFICATIONS

2.8 ACCESSORIES

Add paragraphs H and I as follows:

- H. Wires:
1. General: Wire shall conform to applicable requirements of NEMA WC 3-80, WC 5-73 and WC 7-88.
 2. Test Wires:
 - a) No. 12 AWG wire for prepackaged galvanic anode and test leads and No. 14 AWG reference electrode lead wires shall be single-conductor, stranded copper wire with 600-volt, TW, THWN, THHN or HMWPE insulation.
 - b) No. 2 AWG, No. 4 AWG and No. 8 AWG for bond and pipe lead wires shall be single-conductor, stranded copper wire with 600-volt, HMWPE insulation.
 3. Tracer Wire:
 - a) No. 10 AWG wire for tracer wire shall be single-conductor, solid copper wire with 600-volt, TW, THWN, THHN or HMWPE insulation.
 - b) All wire splices shall be knotted together, and then spliced together using a wire nut and DBY or DBR splice connector.
 4. Wire Identification:
 - a) Wire insulation color shall indicate the function of each wire and shall be as shown on the Drawings and as follows:
 - i) Pipeline test wires:
 - I. Water Pipeline: Blue
 - II. Other Pipeline: White or per ENGINEER request
 - III. Unprotected Pipe: Black
 - ii) Casings: Orange
 - iii) Anode lead wires: Black
 - iv) Reference electrode wires: Yellow
 - v) Tracer wires: Green
- I. Warning Tape: The warning tape shall be in accordance with Section 33 05 20.

Add Article 2.9 as follows:

2.9 BACKFLOW PREVENTION DEVICES

- A. Refer to Section 33 12 17.

PART 3 EXECUTION

3.4 INSTALLATION – PIPE AND FITTING

Replace paragraph G:

- G. All MJ fittings must have megalug pipe or joint restraint or approval equal.

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3.6 INSTALLATION – VALVES AND VALVE BOXES

Add paragraph H.

- H. Tracer wire shall be installed on the outside of the valve box and inserted into the valve box six inches below the ground surface through a small hole drilled or cut into the side of the valve box by the contractor.

3.8 INSTALLATION – SERVICE LINES

Add paragraph D as follows:

- D. OWNER, at OWNER's discretion, may exercise the option of installing service taps for the CONTRACTOR. In such case, CONTRACTOR must:
 - 1. Pay applicable connection fees to OWNER for the indicated size and location of tap to water main. Comply with all requirements of OWNER relating to excavation, traffic control, backfill and protection of the water main as related to the water main tap. OWNER, or its agents, will perform tap to water main.
 - 2. Install service lines as indicated or directed by WATER DEPARTMENT to meter. Additionally, extend Polyethylene pipe to 10 feet beyond sidewalk towards structure being serviced. Provide a 2x4x8 wooden stake at the end of the service line, visibly extended above the finished ground surface, having a blue colored painted end.
 - 3. When relocating water service lines, replace all pipes with polyethylene pipe per Section 33 05 06 and the standard water service detail.
 - 4. Prior to OWNER performing the water main tap, CONTRACTOR shall supply, at CONTRACTOR's expense, any required tapping saddles.
 - 5. When existing meter and meter boxes are relocated, CONTRACTOR is required to reconnect the existing service line from property side to the new meter box location.

3.10 BACKFILLING

Add paragraph D as follows:

- D. Prior to the execution of backfilling procedures for ductile iron pipe or other metallic pipe and fittings, CONTRACTOR must request inspection by OWNER's representative to verify compliance with installation requirements.

Add Article 3.12 as follows:

3.12 INSTALLATION – METER BOXES

- A. Ensure all parts are in working order.
- B. Where water lines are located below paved streets or public right-of-ways containing curbs, install valves and meter boxes at the back of the curb. Such

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installation shall be in accessible locations beyond limits of walks and driveway approaches or other pedestrian and vehicular interference.

- C. Where no curbing exists, install valves and boxes in accessible locations beyond limits of street surfacing, walks and driveway approaches or to other location with no pedestrian or vehicular interference.
- D. Meters shall not be installed in any driveway, pedestrian sidewalk or other location which may be a life or safety concern regarding access and maintenance of such meters.

Add Article 3.13 as follows:

3.13 POLY WRAP

- A. Unless otherwise directed by the ENGINEER, the pipe (ductile iron) and associated fittings and valves will be encased in an 8 mil polyethylene wrap. The wrap may be in either tube or sheet form and installed as described in *Installation Guide for Ductile Iron Pipe* by DIPRA. Locations for service taps must be prepared by fully tapping the location following re-excavation. All holes must be recovered and properly sealed prior to backfilling.

Add Article 3.14 as follows:

3.14 INSTALLATION – BACKFLOW PREVENTION DEVICES

- A. Ensure all parts are in working order.
- B. Set location of backflow prevention devices and boxes outside of sidewalk limits, driveway approaches and other pedestrian or vehicular interference.
- C. Install backflow prevention devices in alignments enabling easy adjustments of mechanical controls and observation of performance gauges. Install backflow prevention devices in accordance with instructions and tolerances specified by the manufacturer per the directive of the City Certified back flow technician.

Add Section 33 12 17 as follows:

SECTION 33 12 17 BACKFLOW PREVENTION DEVICE OR ASSEMBLY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Air gap, reduced pressure assembly, double check valve assembly, pressure vacuum breaker and atmospheric vacuum breaker backpressure and back siphon prevention device assemblies and their installation.

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1.2 REQUIREMENTS

- A. All backpressure and back siphon prevention devices or assemblies shall ensure that the requirements of federal, state, and local agencies pertaining to the quality of water delivered to consumers are met.
- B. Except machined surfaces, coat all items exposed to atmosphere with epoxy paint. Color to be selected by ENGINEER.
- C. Concrete: Class 4000 per APWA Section 03 30 04. Place per APWA Section 03 30 10. Cure per APWA Section 03 39 00.

1.3 REFERENCES

- A. AWWA M14: AWWA Recommended Practice for Backflow Prevention and Cross-Connection Control.
 - 1. AWWA C511-89: AWWA Standard for Reduced Pressure Principle Backflow Prevention Assembly.
 - 2. AWWA C511-92: AWWA Standard for Reduced Pressure Backflow Prevention Assembly.
 - 3. AWWA C510-92: AWWA Standard for Double Check Valve Backflow Prevention Assembly.
 - 4. Cross Connection Control Manual, Accepted Procedure and Practice, Sixth Edition, Cross Connection Control Committee, Pacific Northwest Section – AWWA, December 1995.
 - 5. Cross Connection Control Manual, US Environmental Protection Agency, June 1989.

1.4 SUBMITTALS

- A. Provide technical information as required for evaluating the quality of the backflow prevention device or assembly and its components. As a minimum, include dimensions, weights, materials lists and operation charts.

PART 2 PRODUCTS

2.1 AIR GAP

- A. Use where there is a connection to any facility using a dangerous or toxic substance in toxic concentrations. The air gap shall be located as close as practicable to the service cock. All piping between the service cock and receiving tank shall be entirely visible.

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- B. Physical separation between water supply outlet and flood level rim of the fixture or assembly into which the outlet discharges shall be at least twice the diameter of the water supply outlet but never less than 1-inch.
- C. Where the air gap is within two (2) pipe diameters (horizontal measurement) of a wall or vertical surface, the air gap shall be increased to a minimum of 1.5-inches or to three times the incoming pip diameter, whichever is greater.
- D. Any structure which bridges the air gap causing a bypass renders the system ineffective and shall not be permitted.

2.2 REDUCED-PRESSURE BACKFLOW PREVENTION ASSEMBLY

- A. Use where cross connections are known or probably will exist which cannot be eliminated and where the degree of severity warrants more than a double check valve.
- B. Assembly consists of two independently acting, approved check valves with a hydraulically operating, mechanically independent pressure differential relief valve located between the upstream and downstream check valves. Test cocks should be appropriately located for testing and monitoring of the assembly.
- C. The relief valve shall maintain a minimum pressure in the zone between the upstream check valve and the downstream check valve of 2-psi lower than the supply (upstream) pressure.
- D. If the supply (upstream) pressure falls below 2-psi, the relief valve shall discharge to the atmosphere.

2.3 DOUBLE CHECK VALVE ASSEMBLY

- A. Use where there is an auxiliary water source to the premises handled in separate piping systems. Also, use where a cross connection possibly exists where the substance would be objectionable, but not necessarily hazardous to health.
- B. Assembly consists of two internally loaded check valves, either spring loaded or internally weighted, installed as a unit between two shutoff valves. Test cocks should be appropriately located for testing and monitoring of the assembly. The assembly is located between two tightly closing resilient seated shutoff valves.

2.4 DUAL CHECK VALVE ASSEMBLY

- A. Install as a secondary protection method of the drinking water system, within the meter yoke of non-industrial, low hazard connections.

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- B. Assembly consists of two internally loaded, independently operating check valves, either spring loaded or internally weighted, installed as a unit between two shutoff valves. No test cocks are part of the assembly.

2.5 PRESSURE VACUUM BREAKER

- A. Use only where cross connection is introduced through backsiphonage. This assembly shall not be used in systems where there can be backpressure.
- B. Assembly consists of an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. Test cocks should be appropriately located for testing and monitoring of the assembly. The assembly is located between two tightly closing resilient seated shutoff valves.
- C. The assembly must be installed at least 12-inches above the highest outlet or tank.

2.6 ATMOSPHERIC VACUUM BREAKER

- A. Use only where cross connection is introduced through backsiphonage. This assembly shall not be used in systems where there can be backpressure. No shutoff valves may be placed downstream of the assembly.
- B. Assembly consists of a float check, a check seat, and an air inlet port. An upstream shutoff valve may be an integral part of the assembly.
- C. The assembly must be installed at least 6-inches above the highest outlet or tank.

PART 3 EXECUTION

3.1 INSTALLATION – AIR GAP

- A. The assembly is not to be installed in a pit below ground level. Semiburied pits are acceptable if the assembly is installed above the ground or the maximum flood level.
- B. Assembly shall be located and monitored in such a way as to prohibit bridging of the air gap resulting in cross connection and possible backflow.
- C. In any high hazard installation the air gap shall be inspected within 10 days after initial installation and at least annually thereafter by a certified backflow technician.

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3.2 INSTALLATION – REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY

- A. The assembly shall be installed with adequate space to facilitate maintenance and testing. Ideally, the installation should not require platforms, ladders, or lifts for access.
- B. Adequate clearance from the floor, ceiling, and walls must be provided to facilitate the removal of the relief valve and/or check valves.
- C. The assembly shall be designed to function properly under projected extreme temperature ranges.
- D. The assembly shall not be installed in a pit below ground level. Semiburied pits are acceptable if the assembly is installed above the ground or the maximum flood level with an approved air gap between the relief valve port and the daylight drain. The bottom of the assembly shall be a minimum of 12-inches above the ground or floor.
- E. All reduced pressure backflow prevention assemblies shall be installed in the horizontal alignment.
- F. Thoroughly flush the lines before installing the assembly.
- G. The relief valve on the assembly shall not be directly connected to any waste disposal line, including sanitary sewer, storm drains, or vents.

3.3 INSTALLATION – DOUBLE CHECK VALVE ASSEMBLY

- A. The assembly shall be installed with adequate space to facilitate maintenance and testing and should have free access without the use of platforms, ladders, or lifts.
- B. The assembly should not be installed below ground level unless provided with adequate drainage to maintain a dry location. Where an assembly must be installed in a location that is susceptible to flooding, the test cocks shall be plugged.
- C. Thoroughly flush the lines before installing the assembly.
- D. The assembly shall be installed in a horizontal position unless otherwise directed by the ENGINEER.

3.4 INSTALLATION – DUAL CHECK VALVE DEVICE

- A. The device shall be installed with adequate space to facilitate maintenance and testing and should have free access without the use of platforms, ladders, or lifts.

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- B. The device should not be installed below ground level unless provided with adequate drainage to maintain a dry location.
- C. Thoroughly flush the lines before installing the assembly.
- D. The device shall be installed in a horizontal position unless otherwise directed by the ENGINEER.

3.5 INSTALLATION – PRESSURE VACUUM BREAKER

- A. The assembly shall be installed at least 12-inches above all downstream piping and the highest fixture flood level rim, outlet, or highest point of water use.
- B. The assembly shall be installed in a vertical position with adequate space to facilitate maintenance and testing.
- C. The assembly shall not be installed in a vent hood or where toxic or objectionable fumes could enter and contaminate the potable water piping.
- D. The assembly shall be designed to function properly under projected extreme temperature ranges.
- E. The assembly shall not be installed below ground in a vault or pit.

3.6 INSTALLATION – ATMOSPHERIC VACUUM BREAKER

- A. The device shall not be installed in applications where it will be in continuous operation for more than 12 hours.
- B. The device shall be installed downstream of the last shutoff valve in a system, such that the discharge side is exposed to the atmosphere.
- C. The device shall be installed a minimum of 6-inches above all downstream piping and the highest outlet or flood level rim.
- D. The device shall not be installed in a vent hood or where toxic or objectionable fumes could enter and contaminate the potable water piping. The device shall be installed in a visible location for maintenance.
- E. The device shall be designed to function properly under projected extreme temperature ranges.

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3.7 TESTING AND START-UP

- A. All backflow prevention assemblies shall be tested within 10 days of initial use by a licensed backflow device tester and the report presented to the City's Cross Connection Control Administrator.
- B. All backflow prevention assemblies are to be tested annually by a certified tester and repairs or maintenance completed as needed. All test reports must be presented to the City's Cross Connection Control Administrator.

Add Section 33 12 18 as follows:

SECTION 33 12 18 UNDERGROUND PACKAGED PRESSURE REDUCING STATION

PART 1 PRODUCTS

1.1 SCOPE OF WORK

- A. The contractor shall furnish and install one (1) factory built, factory delivered, underground pressure reducing station, with all necessary internal piping, valves, controls and other necessary appurtenances as shown on the plans and specified herein. The underground pressure reducing station shall be complete when delivered and will not require internal contractor construction except to install the power service through the service conduit provided for that purpose.
- B. The underground pressure reducing station shall be manufactured by Engineered Fluid, Inc. (EFI), Centralia, Illinois, represented by Mr. Chris Horneck of Hydrosol, telephone 303-692-0825, or approved equal.

1.2 QUALITY ASSURANCE

- A. The equipment and materials covered by these specifications are intended to be standard equipment of proven reliability and as manufactured by a reputable manufacturers having experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the contract drawings and operated per manufacturer's recommendations.
- B. It is intended that the manufacturer of the selected equipment shall be a business regularly engaged in the manufacture, assembly, construction, start-up and maintenance of water distribution equipment of the type required for this project. The manufacturer shall have at least ten (10) years of successful experience in providing stations of the type, design, function and quality as required for this project. As such, the station manufacturer shall be required to affix an

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UNDERWRITERS LABORATORIES (UL) LABEL attesting to the compliance of that assembled equipment under the **PACKAGED PUMPING SYSTEMS (QCZJ) UL Listing Category**. This label shall be inclusive of the entire station with enclosure so as to demonstrate compliance with the National Electrical Code requirements for working clearances and wiring procedures. **Equipment manufactured without this third party certification label or equipment manufactured by an outside source or "brokered equipment" defined as systems not assembled on the premises of the named manufacturer by that company's employees WILL NOT be allowed.**

1.3 SUBMITTAL

- A. Equipment submittals shall be bound and in a minimum of six (6) copies. The submittals shall contain a minimum of two (2) full size drawings, size 24" x 36"; one (1) each covering the pressure reducing station and the electrical control schematic. The pressure reducing station drawing shall be specific to this project, in at least three (3) different views, be to scale and illustrate the National Electrical Code (NEC) clearances per Section 110-26 of the Code. The submittal booklets will be complete with data sheets covering all individual components that make up the pressure reducing station and the UL file number under which the manufacturer is listed, service department personnel statement as detailed in the specifications and be complete with the manufacturer's formal warranty policy. **The submittal booklets shall be complete with a full size photocopy of the manufacturer's combination UL/manufacturer logo Packaged Pumping Systems label.**
- B. Two (2) submittal reviews of this item will be accomplished at no cost to the submitting contractor. However, all subsequent reviews will be charged to the submitting contractor at the design engineer's standard hourly billing rate.

PART 2 PRODUCTS

2.1 EQUIPMENT CAPSULE

- A. The equipment capsule size as shown on the drawings for this project is appropriate for National Standard mandated clearances and for proper clearances above, below and around equipment to provide for safe servicing, removal and reinstallation of that equipment.
- B. Likewise, the entrance manway shall be sized to provide for the eventual removal and replacement of any component within the station without altering the station to accomplish that task.
- C. The drawing for this equipment illustrates centerline and clearance/maintenance dimensions about major equipment items. These dimensions are minimums. Dimensions less than those shown "will not" be accepted.

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D. EQUIPMENT CAPSULE - CONSTRUCTION

1. The plate steel employed throughout the capsule shall be 1/4" minimum thickness and meet or exceed the requirements for ASTM A-36. The structural shapes employed shall meet or exceed the requirements for ASTM A-36. Field welding to complete the capsule or attach the entrance hatch will not be allowed.
2. The plate forming the top & bottom of the capsule shall be cold formed prior to assembly so as to form a **lap joint** with the side wall. The **lap joint** shall be continuously welded on the interior by hand & the exterior by machine to form an airtight seal. The lower side wall continuous weld shall be an average 12 inches above the capsule floor, which removes the lower weld from incidental water impingement. **Capsules without lap joints will not be accepted.**
3. **A lap joint detail shall be shown on the submittal drawings.**
4. The **lap joint** shall be in full conformance with Steel Tank Institute (STI) P-3 specifications Section 4.2.6 and Underwriters Laboratories (UL) 58 specifications for steel vessels in buried service, and the American Welding Society (AWS) Structural Welding Code, Section 9.10, for dynamically loaded structures.
5. Any ferrous metal device passing through the capsule wall will be welded fully along its circumference or length on both sides of the capsule wall.
6. The top and bottom of the equipment capsule shall be supported and reinforced by a combination of standard structural shapes of the sizes and weights as shown on the plans for this item.
7. Four (4) or more **lifting plates** of 3/8 inch minimum thickness shall be placed about the perimeter of the capsule to facilitate the lifting and handling of the station.
8. **Interior lifting eyes** shall be placed over each piece of equipment in excess of 60 pounds in weight.
9. The capsule will be complete with a sump. The sump shall be a minimum of eighteen (18) inches in diameter x eight (8) inches deep; the sump shall be provided with a four (4) inch plugged outlet for gravity outflow as required.

2.2 TANK PENETRATION SLEEVE

- A. Tank wall penetrations for all pipes with interior epoxy fusion bonded coating shall include a tank penetration sleeve of at least 1/2 inch thickness. This sleeve shall be attached to the pipes prior to epoxy coating. The sleeve shall prevent destruction of the pipe coating at weld locations. This sleeve shall be shown on submittal drawings.

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2.3 ENTRANCE MANWAY

- A. The equipment capsule entrance manway shall be a prefabricated ferrous casting with a minimum clear opening of thirty-six (36) inches. The access manway shall be designed when installed to be flush mounted at finished grade so that vehicular or pedestrian traffic can pass smoothly over the cover. Metal used in the manufacture of castings shall conform to ASTM A48-83 Class 35B for Gray Iron. All castings shall be manufactured true to pattern. Component parts shall fit together to prevent rocking and rattling. The access manway shall have a gasket seal and bolted lid for water resistance.

THE ACCESS MANWAY SHALL BE A NEENAH MODEL R-1916-K.

2.4 ACCESS LADDER

- A. An all aluminum access ladder will be provided. The ladder shall meet UL approval and OSHA qualifications under the Type I, Heavy Duty Specifications. The ladder will have 1-1/4" diameter, tempered, serrated rungs with 3" x 1-1/8" full I-Beam side rails. The uppermost ends of the side rails will be protected by plastic caps bolted into place. The complete access ladder will be bolted into place, at a minimum of two (2) points both top and bottom, so as to be easily removable to facilitate equipment maintenance.
- B. A Bilco Model LU-1 ladder-up safety post shall be installed on the vertical centerline of the entrance ladder.

2.5 SAFETY MATTING

- A. The capsule walkway areas (that space from the entrance ladder to the power panel and the entire NEC clearance area) shall be covered with a Nyracord industrial safety matting. The mat shall be a heavy duty, 1/2 inch minimum thickness Nyracord compound (rubber blend with fiber reinforcement) of open slot design with a ribbed safety pattern (ribbed in two directions) to promote sure footing. The underside of the safety mat shall also be ribbed (in one direction only) to permit aeration and drainage. The safety mat shall not be glued to the floor surface.

2.6 CORROSION PROTECTION

- A. All surfaces of the entire structure shall be gritblasted equal to commercial blast cleaning (SSPC-SP6).
- B. The protective coating shall take place immediately after surface preparation. The protective coating shall be Tnemec Series 66 Hi-Build Epoxoline consisting of a two-component, high solids, amide-cured epoxy system formulated for high build application having excellent chemical and corrosion resistant properties. The

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epoxy system shall be self-priming and require no intermediate coatings. The protective coating shall provide in two (2) applications a total dry mil thickness of 8.0 mils.

- C. The station manufacturer shall furnish two (2) seventeen pound packaged magnesium anodes for cathodic protection. The anodes shall be buried equally spaced around the station and connected by heavy copper wire to lugs on the station provided for that purpose.

2.7 PIPING

- A. Piping shall be steel and conform to material specification ASTM A-53(CW) for nominal pipe size four (4) inch and smaller and ASTM A-53(ERW) Grade B for nominal pipe size five (5) inches and larger. Steel butt-welding fittings shall conform to material specification ASTM A-234 Grade WPB and to the dimensions and tolerances of ANSI Standards B16.9 and B16.28 respectively.
- B. Forged steel flanges shall conform to material specification ASTM A-105 Class 60 and/or ASTM A-181 for carbon steel forgings and to the dimensions and tolerances of ANSI Standards B16.5 as amended in 1992 for Class 150 and Class 300 flanges.
- C. The piping sizes shall be as shown on the drawing.
 - Size 10 inch and below - Schedule 40
 - Size 12 inch and above - Standard weight (.375" wall)
- D. All pipe welds shall be performed by certified welders employed by the station manufacturer. As part of the equipment submittal, the station manufacturer shall provide copies of the welding certificates of the employees who are to perform the pipe welds.
- E. All piping surfaces shall be prepared by sandblasting, or other abrasive blasting, prior to any welds taking place. Piping of 5" diameter and smaller may be cut by saw. Piping of 6" diameter and larger shall be bevel cut, and Oxyfuel or Plasma-arc cutting techniques shall be used to assure and facilitate bevel pipe cuts. No saw cuts or other form of abrasive cut-offs are allowed on 6" and larger diameter pipe.
- F. In all cases, short circuit transfer, spray transfer or pulse-arc transfer modes of the gas metal arc welding process shall be applied semi-automatically. When utilizing the short circuit mode, shielding gas consisting of 50% carbon dioxide and 50% argon gas shall be used. When utilizing the spray or pulse-arc transfer modes, a shielding gas consisting of 5% carbon dioxide and 95% argon shall be used. In all cases, welding wire with a minimum tensile strength of 70,000 psi shall be employed. All flange welds and butt welds of equal size pipe shall be a single continuous nonstop weld around the complete circumference of the pipe.

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Whenever possible, vertical up weld passes will be applied to all pipe welds. No vertical down weld passes will be allowed. Completed welding assemblies shall create no internal obstruction, restriction or create any unintended sources of water deflection.

- G. Piping of six (6) inch diameter and larger shall require a minimum of two (2) weld passes to complete each weld. The first pass, or root pass, shall be applied at the bottom of the bevel cut using the short circuit transfer welding mode, and the second pass, or cap pass, shall be applied over the root pass using the spray or pulse arc transfer welding modes to insure that at a minimum the total weld thickness shall be equal to thinnest of the two pieces being welded together.

2.8 PIPE SUPPORTS

- A. Pipe supports by minimum sizing for:
- 4" and smaller piping shall be 2" x 2" x 3/16" wall rectangular tubing;
 - 6" through 12" piping shall be 3" x 3" x 1/4" wall rectangular tubing;
 - 14" through 24" piping shall be 4" x 4" x 1/4" wall rectangular tubing and,
 - 6" and larger piping shall be provided with "kick" bracing projecting fully from the underside of the pipe to the floor at an angle of no less than 15E from vertical out at a right angle to the run of the pipe being supported. These "kick" braces shall be in addition to the vertical pipe supports called out above.
- B. Pipe supports are to be fully welded at both end points to the pipe and steel floor where required.
- C. Simple pipe stands made of pipe welded only at the floor and upholding a yoke or bracket with or without a threaded jack bolt or a U-bolt are not acceptable, as no lateral or transverse support is provided.

2.9 FUSION BONDED EPOXY COATING - STEEL PIPING

- A. Steel piping shall have applied to it a Fusion Bonded Epoxy Coating on the interior pipe surface that conforms to AWWA C-213-91 for steel water pipelines. The powder coating product shall be National Sanitation Foundation (NSF) Standard 61 certified material. The final product shall be capable of meeting Salt Spray Resistance ASTM B117 (1000 hour) with no blistering, undercutting or rust bleed; Humidity Resistance ASTM D2247 (1000 hour) with no blistering, undercutting or rust bleed; and Impact Resistance of ASTM G14-72 (160 in. lbs.). The Fusion Bonded Epoxy Coating shall provide a total dry mil thickness of 12.0 to 14.0 mils. The epoxy powder coating shall be Pipe Clad7 1500 Red latest revision from Lilly Industries, Inc.

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B. Prior to shipment of the station, the station manufacturer shall provide in writing to the Engineer certification that the fusion bonded epoxy coating has been applied to all internal surfaces of the steel piping using the proper method. Said certification shall show under the station manufacturer's letterhead:

- Date of application;
- Material manufacturer and product designation including a product data sheet for the coating;
- Applier of the fusion bonded coating, name, address and phone number;
- Notarized signature of an officer of the station manufacturing company stating the fusion bonded epoxy coating was applied to AWWA Standard C213-91 or the latest revision.

2.10 SERVICE CONNECTIONS ON INTERNAL PIPING

A. All plumbed devices within the station eventually requiring service, such as control valves, and like equipment, shall be easily removed from the piping by the presence of appropriately placed and sufficient quantity of adaptors and couplings as shown on the drawings; no less than the quantity of couplings and adaptors shown shall be allowed.

2.11 RESTRAINING POINTS

A. The main inlet and outlet piping to the station shall each be provided with two (2) or four (4) restraining points as welded on "eyes" or similar device welded to the capsule or framing to facilitate the attachment of joint restraint tie rods or other device to be used in retarding any pipe movement at the connections.

2.12 COMPRESSION COUPLINGS

A. The pressure reducing station piping shall include a compression type, flexible coupling to prevent binding and facilitate removal of associated equipment where shown on the plans for this item. In lieu of a compression coupling, a Uni-Flange or a flanged coupling adapter (FCA) may be used.

B. All compression couplings, Uni-Flanges, flanged coupling adapters (FCA), and flexible connectors/ expansion joints shall include a minimum of two (2) control joint rods with appropriate restraining points.

2.13 COMBINATION PRESSURE GAUGES

A. Combination pressure gauges shall be glycerine filled with a built-in pressure snubber and have 4-1/2 inch minimum diameter faces and be turret style, black phenolic case with clear glass face. The movement shall be rotary, of 400 Series stainless steel with teflon coated pinion gear and segment. The gauge shall be

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bottom connected and accept a 1/4" NPT female thread. Combination pressure gauge range and scale graduations shall be in psi and feet of water as follows:

INLET PRESSURE - 0 to 200 psi, 20 psi figure intervals, with graduating marks every 2 psi (0-460 feet).

OUTLET PRESSURE - 0 to 100 psi, 10 psi figure intervals, with graduating marks every 1 psi (0-230 feet).

- B. All gauges will be panel mounted** off the pipeline and be flexible connected to their respective sensing point. The gauge trim tubing shall be complete with both isolating and vent valves and the tubing shall be so arranged as to easily vent air and facilitate gauge removal. Gauges mounted directly to the pipeline or at the sensing point **will not be accepted.**

GAUGES SHALL BE ASHCROFT MODEL 1279ASL.

2.14 SAMPLE TAP

- A.** A single, right angle outlet, smooth nose, brass sample tap shall be affixed to the manual vent ball valve on the inlet pressure gauge assembly.

2.15 BUTTERFLY VALVES

- A.** Valve body shall be wafer style and meet ANSI Class 125/150 flange standards. Metal reinforced dovetail seat shall ensure drop tight, bi-directional shutoff and shall be field replaceable. The stem shall be one piece. The disc and stem shall be connected by a stainless steel torque plug which shall provide positive engagement. The valve shall have upper and lower RTFE inboard stem bearings, isolated from the line media, and a heavy-duty upper stem bushing.
- B.** The valve body shall be cast iron; aluminum bronze disc; stainless steel stem; EPDM seat; acetal upper stem bushing; BUNA-N V-cup stem seal.
- C.** Valve sized six (6) inches and smaller shall be equipped with lever operator and 10 degree increment throttling plate. Valve sized eight (8) inches and larger shall be equipped with a weather-proof, heavy-duty, gear operator complete with a position indicator.

BUTTERFLY VALVES SHALL BE KEYSTONE MODEL 221-784.

2.16 PRESSURE REDUCING VALVE

- A.** Two (2) pressure reducing valves shall be provided as sized and shown on the plan sheet. Each water pressure reducing valve shall be a pilot controlled, hydraulically operated, diaphragm actuated, globe pattern valve. The valve in

SECTION 5: STANDARD SPECIFICATIONS

operation shall function to maintain a constant downstream pressure regardless of varying inlet head. The main valve shall be single seated and have a removable seat insert. The disc shall contain a replaceable, resilient rubber seat that will guarantee drop tight shut off when closed against the seat insert.

- B. Seat trim shall be 303 stainless steel, and an X101 valve position indicator shall be provided. The valve shall be sized as shown on the plan and be globe pattern, flanged to meet ANSI Class 125.
- C. The control pilot shall be a direct acting, adjustable, spring-loaded, normally open diaphragm valve designed to permit main valve opening when the reduced outlet pressure is less than the pilot set point. The control pilot shall be bronze with stainless steel trim. The control pilot shall be easily adjustable 25 psi above or below the set point.

THE REDUCING VALVE SHALL BE CLA-VAL MODEL 90G-01ABC, with X101.

PART 3 EXECUTION

3.1 PRESSURE TESTING

- A. When the station plumbing is completed, the pressure piping within the station, including valves, control valves, fittings, connections as make up the entire system shall be hydrostatically tested at a pressure of 100 psi or a pressure equal to the lowest test pressure rating of the equipment within the tested system, whichever is greater pressure. The test pressure shall be applied for a minimum of 20 minutes, during which time all joints, connections & seams shall be checked for leaking. Any deficiencies found shall be repaired and the system shall be retested.
- B. The results of this testing shall be transmitted in writing to the Engineer prior to shipment of the station and shall note test pressure, time at full pressure and be signed by the Quality Control Manager or test technician.

3.2 CONFORMANCE TO BASIC ELECTRICAL STANDARDS

- A. The manufacturer of electrical power panels and their mounting and installation shall be done in strict accordance with the requirements of Underwriters Laboratories (UL) and the National Electrical Code (NEC) latest revision so as to afford a measure of security as to the ability of the eventual owner to safely operate the equipment. No exceptions to the requirements of these codes and standards will be allowed; failure to meet these requirements will be cause to remove the equipment and correct the violation.

SECTION 5: STANDARD SPECIFICATIONS

3.3 U.L. LISTING

- A. All service entrance and power panels shall be constructed and installed in strict accordance with **Underwriters Laboratories (UL) Standard 508 "Industrial Control Equipment."** The UL label shall also include an **SE "Service Entrance"** rating stating that the main power panel is suitable for use as service entrance equipment. The panels shall be shop inspected by UL, or constructed in a UL recognized facility. All panels shall bear a serialized UL label indicating acceptance under Standard 508 and under Enclosed Industrial Control Panel or Service Equipment Panel. In addition, a photocopy of the UL labels for this specific project shall be transmitted to both the project engineer and the contractor for installation within their permanent project files, **prior to shipment of the equipment covered under these specifications.**

3.4 E.T.L. LISTING

- A. All power panels shall be E.T.L. Listed by Interek Testing Services (ITS) under Category 4 - Industrial Control Equipment. Each completed panel shall bear an E.T.L. listing label. The listing label shall include the station manufacturer's name, address and telephone number. The station manufacturer shall have quarterly inspections performed by ITS at the manufacturer's facilities to ensure that the products being listed comply with the report and procedural guide for that product.

3.5 EQUIPMENT GROUNDING

- A. Each electrical equipment item in the station shall be properly grounded per Section 250 of the National Electrical Code. Items to be grounded include, but are not limited to, power panel, convenience receptacles, dedicated receptacle for sump pump/dehumidifier, heater, lights, light switch, exhaust fans and pressure switches.
- B. All ground wires from installed equipment shall be in conduit and shall lead back to the power panel to a plated aluminum ground buss specific for grounding purposes and so labeled. The ground buss shall be complete with a lug large enough to accept the installing electrician's bare copper earth ground wire. The bus shall serve as a bond between the earth ground and the equipment ground wires.

3.6 ELECTRICAL APPARATUS - POWER PANEL

- A. **All circuit breakers shall be incorporated into one (1) NEMA 1 panel.** The electrical service provided for this station will be 230 volt, 1 phase, 60 cycle, 3 wire.

SECTION 5: STANDARD SPECIFICATIONS

- B. There shall be provided, thermal-magnetic trip circuit breakers as follows:

One (1) Main Breaker, 2 pole, 50 amps;
Six (6) Auxiliary Circuit Breakers, as follows:

1. Spare
2. Lights
3. Heater
4. Exhaust Fan
5. Sump Pump – Dehumidifier
6. Convenience Outlets

3.7 ELECTRICAL APPARATUS - CONDUIT AND WIRING

- A. The service entrance conduits shall be **rigid steel conduit**, individually sized to accept the inbound service conductors and shall be installed from the main power panel through the equipment capsule side sheet and terminate exterior to the equipment capsule. The service entrance exterior conduit connection points shall be capped or plugged for shipment.
- B. All wiring within the equipment capsule and outside of the panel shall be run in conduit except for the watertight flexible conduit and fittings properly used to connect fan motors, limit switches, etc., where flexible connections are best utilized. Only the sump pump and dehumidifier, where furnished by the original manufacturer with a UL approved rubber cord and plug, may be plugged into a receptacle.
- C. EQUIPMENT CAPSULE CONDUIT - Rigid, heavy wall, Schedule 40 PVC with solvent weld moisture-proof connections, in minimum size 3/4" or larger, sized to handle the type, number and size of equipment conductors to be carried - in compliance with Article 347 of the National Electrical Code and NEMA TC-2, Federal WC-1094A and UL-651 Underwriters Laboratory Specifications.
- D. FLEXIBLE CONNECTIONS - Where flexible conduit connections are necessary, the conduit used shall be liquid-tight, flexible, totally nonmetallic, corrosion resistant, nonconductive, U.L. listed conduit sized to handle the type, number and size of equipment conductors to be carried - in compliance with Article 351 of the National Electrical Code.
- E. MOTOR CIRCUIT CONDUCTORS - Sized for load. All branch circuit conductors supplying a single motor of one (1) horsepower or more shall have an ampacity of not less than 125 percent of the motor full load current rating, dual rated type THHN/THWN, as set forth in Article 310 and 430-B of the National Electrical Code, Schedule 310-13 for flame retardant, heat resistant thermoplastic, copper conductors in a nylon or equivalent outer covering.

SECTION 5: STANDARD SPECIFICATIONS

- F. **CONTROL AND ACCESSORY WIRING** - Sized for load, type MTW/AWM (Machine tool wire/appliance wiring material) as set forth in Article 310 and 670 of the National Electrical Code, Schedule 310-13 and NFPA Standard 79 for flame retardant, moisture, heat and oil resistant thermoplastic, copper conductors in compliance with NMTBA and as listed by Underwriters Laboratories (AWM), except where accessories are furnished with a manufacturer supplied UL approved rubber cord and plug.

3.8 ELECTRICAL APPARATUS – RECEPTACLES

- A. **Two (2) duplex, ground fault circuit interrupter type receptacles** shall be furnished about the periphery of the equipment capsule, with one (1) receptacle adjacent to the main power panel. **One (1) additional receptacle, three-wire grounded type**, shall be installed and dedicated solely to sump pump/dehumidifier service only.

3.9 CONVENIENCE GROUP - LIGHTING

- A. There shall be one or more two-tube, 32 watt per tube, electronic start, enclosed and gasketed, forty-eight (48) inch minimum length fluorescent light fixtures installed within the equipment capsule, as shown on the plan for this item. One (1) light fixture shall be located directly over the main control panel. The light switch shall be of the night glow type and be located within the hatch periphery. The light switch shall be wired to operate the exhaust fan equipment whenever the equipment capsule lights are on. Open fluorescent or incandescent fixtures will not be accepted.

3.10 CONVENIENCE GROUP - HEATER

One (1) each, wall mounted as shown.

1. Rating - 10,240 BTU/HR - 3000 watts, 230 volt.
2. Enclosed resistance wire within steel finned element.
3. Control - thermostat.
4. UL listed.
5. Vane axial fan - floor flow discharge.
6. Hard wired in conduit per UL 400-1.

3.11 CONVENIENCE GROUP - EXHAUST FAN

One (1) each, installed as shown.

1. Capacity each 232 cfm at .2 inch static pressure.
2. Shaded pole motor - squirrel cage blower.
3. Hard wired in conduit to conduit box on motor per UL 400-1.

SECTION 5: STANDARD SPECIFICATIONS

4. 120 volt A.C. operation from wall mount thermostat and HAND/AUTO switch on main control panel.
5. Hatch installed limit switch to activate exhaust fan whenever the entrance hatch is open.
6. Exhaust air piping - 3 inch minimum.
7. Air return piping - 3 inch minimum.
8. Exhaust and return piping protected by 180E PVC return bend with removable insect screen.
9. The automatic exhaust fan system specified herein should exempt this station from the limitations of permit-required confined space as detailed in the Code of Federal Regulations 1910.146(C)(5)(i)(B).

3.12 CONVENIENCE GROUP - SUMP PUMP

One (1) each, installed as shown.

1. Capacity 19 gpm at 15 feet TDH.
2. Impeller - glass filled valor.
3. Cast iron motor shell, switch cap and pump housing.
4. UL listed submersible oil filled motor - UL listed rubber power cord - 120 volt AC operation.\
5. Float operated, submersible (NEMA 6) mechanical switch.
6. Completely submersible, hermetically sealed.
7. Auto reset thermal overload protection.
8. PVC pump discharge piping 12" x 13" with single check valve - union both sides.
9. Provision for dewatering drain system for freeze protection.

3.13 CONVENIENCE GROUP - DEHUMIDIFIER

One (1) each, installed as shown.

1. Capacity 25 pints per 24 hours (AHAM Standard DH-1).
2. Refrigerant type, with environmentally safe refrigerant.
3. Compressor rated 1/5 HP, 4.1 amps, 400 watts.
4. Condensate piped direct to sump.
5. 120 volt AC operation by dial-controlled adjustable humidistat.
6. UL listed rubber cord.

3.14 FACTORY START-UP SERVICE

- A. Start-up service technician shall be a **regular employee of the pressure reducing station manufacturer.**
- B. As part of the submittal covering this equipment, list the factory service manager, his employee number, his telephone number with extension and his number of

SECTION 5: STANDARD SPECIFICATIONS

years with the company. List also each start-up service technician, his employee number and years of service with the company.

- C. Verify that one (1) or more of the service technicians listed above will perform the required start-up service on the equipment covered in the submittal.
- D. One (1) full day at job site for start-up and training.
- E. Start-up service to include two (2) bound O&M manuals.
- F. Start-up service report attested to by start-up technician and representative of owner or engineer.
- G. Service report distributed to:
 - 1. Manufacturer's File
 - 2. Engineer's File
 - 3. Contractor's File
 - 4. Owner's File

3.15 WARRANTY

- A. The warranty is the responsibility of the station manufacturer and that warranty shall be provided in written form to the contractor for inclusion with the submittal and said warranty shall at a minimum cover:
 - 1. A period of one (1) year commencing upon **station acceptance** by the Owner and Engineer.
 - 2. The one (1) year period shall be inviolate regardless of any component manufacturer's warranty for equipment and components within the station.
 - 3. The warranty shall cover **all** equipment, components and systems provided in or with the station.
 - 4. The warranty shall provide for replacement and/or repair of faulty or defective components at no cost to the owner during the warranty period.
 - 5. Where deemed necessary, the manufacturer will be responsible for the labor of removal and reinstalling the defective or faulty components without cost to the owner.
 - 6. No assumption of contingent liabilities for any component failure during warranty is made.

3.16 GENERAL LIABILITY INSURANCE

- A. The pressure reducing station manufacturer shall furnish premises/ operations and products/completed operations general liability insurance from an insurance company with a rating of A-V according to the most recent Best's Key Rating Guide, in an amount equal to \$10,000,000 per occurrence. The insurance certificate must be included with the manufacturer's submittal. The coverage

SECTION 5: STANDARD SPECIFICATIONS

must be provided by an insurance carrier licensed and admitted in the state of manufacture.

SECTION 33 12 19 HYDRANTS

PART 2 PRODUCTS

2.1 DRY-BARREL FIRE HYDRANT

Revise subparagraph 6 as follows

6. Depth of Burial: 60 inches or consistent with main depth.

Add subparagraph 11 to paragraph A as follows:

11. Dry-barrel fire hydrant shall be a Mueller Super Centurion 250 Model A-423, Waterous WB67-250 or Clow Medallion fire hydrant

SECTION 33 41 00 STORM DRAINAGE SYSTEMS

PART 2 PRODUCTS

2.1 PIPING AND FITTINGS

Add paragraph D as follows:

- D. High density polyethylene (HDPE) pipe may be considered for systems smaller than 24-inches in diameter outside the municipal right-of-way, per Herriman City Engineer approval. All other storm drain pipe shall be minimum class III reinforced concrete. Exceptions may be granted by the Herriman City Engineer at his discretion. Pressurized irrigation may use material for appropriate pressure rating requirements.

2.5 CLEANOUTS AND MANHOLES

Revise paragraph B to read as follows:

- C. Steps: Required.

END OF DOCUMENT

SECTION 6: STANDARD PLANS

SECTION 6: STANDARD PLANS

Section 6: Standard Plans

**4th EDITION - HERRIMAN CITY AMENDMENTS,
ADDITIONS AND CLARIFICATIONS**

to the

APWA MANUAL OF STANDARD PLANS – 2007 EDITION

AMENDMENTS, ADDITIONS AND CLARIFICATIONS

The following contains the 5th Edition of Herriman City's Amendments, Additions and Clarifications to the APWA Manual of Standard Plans – 2007 Edition.

The standards and specifications contained in the following amendments, additions and clarifications revise the 2007 Edition of the APWA Manual of Standard Plans and are applicable to all public works projects constructed under permit by Herriman City.

Should conflicts arise between the APWA Manual of Standard Plans and the 5th Edition – Herriman City Amendments, Additions and Clarifications to the APWA Manual of Standard Plans – 2007 Edition, the latter shall govern and take precedence.

END OF DOCUMENT

SECTION 6: STANDARD PLANS

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TYPICAL ROADWAY CROSS SECTIONS	RD-01C
TYPICAL STREET INTERSECTIONS	RD-02
STANDARD CUL-DE-SAC	RD-03
SUPERELEVATED KNUCKLE	RD-04
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STANDARD REGULATORY AND WARNING SIGN	RD-06
FIRE APPARATUS ACCESS ROADS	RD-07
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TOWNE CENTER STREET LIGHTS	SL-07
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REDUCED PRESSURE BACKFLOW PREVENTION (SUSPENDED)	CW-04
DOUBLE CHECK VALVE BACKFLOW PREVENTION (SURFACE)	CW-05
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SECTION 6: STANDARD PLANS

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ABBREVIATIONS

RD	Roadway
SL	Street Lights
CW	Culinary Water
SW	Secondary Water
LP	Landscape
IR	Irrigation

APPENDIX A: BOND AGREEMENTS

**Bond Agreement for Completion
of Proposed Improvements
(Cashier's Check Form)**

THIS BOND AGREEMENT (this "*Agreement*") is made and entered into effective _____, 20___, by and between **HERRIMAN**, a municipal corporation of the State of Utah, whose address is 13011 South Pioneer Street, Herriman, Utah 84065 (the "*City*"), and the undersigned, who is the owner (or soon to be owner) of real property that is located within the City (referred to in this Agreement as "*Developer*").

RECITALS :

A. Developer owns, or will soon own, legal title to the real property (the "*Property*") that is described on exhibit "A."

B. Developer has filed, or will soon file, a request (the "*Application*") with the City for approval of the subdivision known as or to be known as _____ ("*Subdivision*").

C. Developer has requested that the City allow the Owner to proceed with subdivision plat recording before completion of Improvements (the "*Improvements*") required as a condition precedent to subdivision plat recording. The Improvements are described on exhibit "B" annexed hereto.

D. The City is willing to permit the recording of the final plat for the Subdivision conditioned on Developer's promise to install the Improvements as specified in this Agreement, and on Developer's deposit with the City of a cashier's check in an amount equal to the estimated construction cost of the Improvements to be held as specified in this Agreement.

E. The parties intend to set forth herein their entire agreement regarding the Improvements, and to supercede hereby and to consolidate herein all of their prior negotiations and agreements, whether oral or written, regarding the same.

AGREEMENT :

NOW, THEREFORE, in consideration of the recitals above, the mutual covenants and undertakings of the parties hereto, and for other good and valuable consideration, the receipt and legal sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

Section 1. **Developer's Completion and Warranty Obligations.** Developer irrevocably acknowledges its obligation to install the Improvements without cost to the City and hereby agrees to satisfactorily complete the installation of the Improvements in a good, workmanlike, lien-free manner within two (2) years after the date of this Agreement. Further, Developer hereby warrants that the Improvements will be free of defects (normal wear and tear excepted) for a period of one (1) year after all of the Improvements have been installed and finally accepted by the City (the "*Warranty*").

Section 2. **Repairs.** Developer and the City agree that all responsibility for repair and maintenance of the Improvements remains with Developer until all of the Improvements have been installed and finally accepted by the City (collectively, "*Installation/Acceptance*") and the Warranty has expired.

Section 3. **Deposit.** To assure and guaranty (a) the satisfactory and timely Installation/Acceptance of the Improvements, and (b) the Warranty, Developer shall contemporaneously herewith deposit with the City a cashier's check made payable to the order of the City in the amount of \$_____, issued by _____ as cashier's check no. _____ (collectively referred to as "*the Deposit*"). The City shall deposit the referenced cashier's check in its general fund. The amount of the Deposit is the estimated cost of the Improvements, including contingencies.

Section 4. **Assignment of Deposit.** Developer hereby assigns, transfers and sets over to the City all of Developer's right, title and interest in and to the full proceeds of the Deposit and also hereby assigns, transfers and sets over to the City the right to use the Deposit in the event of any default or noncompliance in the performance for which this bond is posted and filed.

Section 5. **Release of Deposit.** If an element of the Improvements (i.e., storm drain, roadway, parks and open space and/or culinary and irrigation water) has been constructed to the reasonable satisfaction of the City, then the City will release fifty percent (50%) of the Deposit that is associated with such element. Upon Installation/Acceptance of an element of the Improvements, the City will release twenty-five (25%) of the Deposit that is associated with such element. Further, if one (1) year after final Installation/Acceptance of the Improvements, the Improvements are then free of defects, normal wear and tear excepted, the City will release the remaining amount of the Deposit.

Section 6. **Failure to Install Improvements/Failure of Warranty.** If (a) Installation/Acceptance of the Improvements has not occurred within two (2) years after the date of this Agreement, or (b) the installed Improvements are not free of defects for eighteen (18) months after final acceptance by the City, then the City may unilaterally (without consent or approval of any kind from Developer) at any time thereafter use the Deposit (full or any amount). The City shall be deemed fully authorized (without further action or notice whatsoever) to use as much of the Deposit as is required (in the City's sole opinion) to satisfactorily complete installation of the Improvements and/or to repair any defects therein, including (without limitation) the cost of any and all incidental construction, legal, administrative or engineering fees or expenses incurred by the City to effect such work. Any balance of the Deposit remaining after payment of all of such costs, fees and expenses, and a reasonable reserve, in an amount determined by the City, shall be refunded to Developer.

Section 7. **No Waiver or Estoppel.** This Agreement is irrevocable unless revoked by the mutual consent of Developer and the City. Neither this Agreement nor the deposit of the referenced cashier's check by Developer and the acceptance of the Deposit or this Agreement by the City shall constitute a waiver or estoppel by or against the City concerning the Improvements, nor shall any such matters in any way relieve Developer from the obligations to (a) timely achieve

satisfactory Installation/Acceptance of the Improvements, or (b) fully perform under the Warranty, regardless of whether or not the Deposit is adequate to pay for the satisfactory Installation/Acceptance of the Improvements or the satisfactory fulfillment of the Warranty. If the Deposit is inadequate to pay for the cost of Improvements for whatever reason, Developer agrees to pay such deficiency independent of this Agreement which amount may include any and all incidental construction, legal, administrative or engineering fees or expenses incurred by the City to effect such work. Additionally no further permits or approvals shall be issued with respect to the Subdivision or to the Developer until such deficiency is cured.

Section 8. **Inspection.** The City shall have the right to inspect Improvements during construction. The Developer shall notify the City in writing when underground improvements are ready to be backfilled and agrees not to backfill such trenches or excavations until such underground improvements have been inspected by the City.

Section 9. **General Provisions.** The following provisions are also an integral part of this Agreement:

(a) **Binding Agreement.** This Agreement shall be binding upon and shall inure to the benefit of the successors and assigns of the respective parties hereto.

(b) **Captions.** The headings used in this Agreement are inserted for reference purposes only and shall not be deemed to define, limit, extend, describe, or affect in any way the meaning, scope or interpretation of any of the terms or provisions of this Agreement or the intent hereof.

(c) **Counterparts.** This Agreement may be signed in any number of counterparts with the same effect as if the signatures upon any counterpart were upon the same instrument. All signed counterparts shall be deemed to be one original.

(d) **Severability.** The provisions of this Agreement are severable, and should any provision hereof be void, voidable, unenforceable or invalid, such void, voidable, unenforceable or invalid provision shall not affect the other provisions of this Agreement.

(e) **Waiver of Breach.** Any waiver by either party of any breach of any kind or character whatsoever by the other, whether such be direct or implied, shall not be construed as a continuing waiver of, or consent to any subsequent breach of this Agreement.

(f) **Cumulative Remedies.** The rights and remedies of the parties hereto shall be construed cumulatively, and none of the rights and remedies shall be exclusive of, in lieu of, or a limitation of any other right, remedy or priority allowed by law.

(g) **Amendment.** This Agreement may not be modified except by an instrument in writing signed by the parties hereto.

(h) **Interpretation.** This Agreement shall be interpreted, construed and enforced according to the substantive laws of the state of Utah.

(i) Attorneys' Fees. In the event any action or proceeding is brought by either party regarding this Agreement, the prevailing party shall be entitled to recover its costs, expert witness fees, and reasonable attorneys' fees, whether such sums are expended with or without suit, at trial or on appeal.

(j) Notice. Any notice or other communication required or permitted to be given hereunder shall be deemed to have been received (a) upon personal delivery or actual receipt thereof or (b) within two (2) days after such notice is deposited in the United States mail, postage prepaid and certified and addressed to the respective addresses set forth herein or to such other address(es) as may be supplied by a party to the other from time to time in writing.

(k) Time of Essence. Time is the essence of this Agreement.

(l) Assignment. Developer may not assign or otherwise convey its rights or delegate its duties under this Agreement without the express written consent of the City.

(m) No Partnership. The City and Developer do not by this Agreement in any way or for any purpose become partners or joint venturers with each other.

(n) Benefit of Agreement. The benefits and protection provided by this Agreement shall inure solely to the City. The City shall not be liable for any claim or obligation of Developer. City may, in its sole and absolute discretion, interplead the Deposit (full or any amount thereof) with a court pursuant to Utah R. Civ. P. 67 and Utah Code Ann. § 76-27-4,

(o) Exhibits. All exhibits annexed to this Agreement are expressly made a part of this Agreement as though completely set forth herein. All references to this Agreement, either in this Agreement itself or in any such writings, shall be deemed to refer to and include the Agreement and all exhibits and writings.

DATED effective the date first above written.

DEVELOPER:

By: _____
Its: _____
Address: _____

HERRIMAN CITY:

ATTEST:

By: _____
Kristi Peterson, Recorder

By: _____
J. Lynn Crane, Mayor

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by _____, as the _____
of _____.

My Commission Expires: _____

Notary Public
Residing at: _____

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by **J. LYNN CRANE** and **KRISTI PETERSON**, the Mayor and the Recorder,
respectively, of the **CITY OF HERRIMAN**, a Utah municipality.

My Commission Expires: _____

Notary Public
Residing at: 13011 South Pioneer Street
Herriman, UT 84096

Exhibit "A"
to Bond Agreement for
Completion of Proposed Improvements

[legal description]

Exhibit "B"
to Bond Agreement for
Completion of Proposed Improvements
[Improvements]

**Bond Agreement for Completion
of Proposed Improvements
(Escrow Form)**

THIS BOND AGREEMENT (this "*Agreement*") is made and entered into effective ____, 20__, by and among **Herriman**, a municipal corporation of the State of Utah whose address is 13011 South Pioneer Street, Herriman, Utah 84065 (the "*City*"), the undersigned, who is the owner (or soon to be owner) of real property that is located within the City (referred to in this Agreement as "*Developer*"), and the undersigned escrow agent ("*Escrow Agent*").

RECITALS:

A. Developer owns, or will soon own, legal title to the real property (the "*Property*") that is particularly described on exhibit "A" annexed hereto.

B. Developer has filed, or will soon file, a request (the "*Application*") with the City for approval of the subdivision known as or to be known as _____ ("*Subdivision*").

C. Developer has requested that the City allow the Owner to proceed with subdivision plat recording before completion of Improvements (the "*Improvements*") required as a condition precedent to subdivision plat recording. The Improvements are described on exhibit "B" annexed hereto.

D. The City is willing to permit the recording of the final plat for the Subdivision conditioned on Developer's promise to install the Improvements as specified in this Agreement, and on Developer's deposit into an escrow controlled by Escrow Agent of the estimated cost as determined by the City of the Improvements, to be held as specified in this Agreement.

E. The parties intend to set forth herein their entire agreement regarding the subject deferral and escrow, and to supercede hereby and to consolidate herein all of their prior negotiations and agreements, whether oral or written, regarding the same.

AGREEMENT:

NOW, THEREFORE, in consideration of the recitals above, the mutual covenants and undertakings of the parties hereto, and for other good and valuable consideration, the receipt and legal sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

Section 1. **Developer's Completion and Warranty Obligations.** Developer irrevocably acknowledges its obligation to install the Improvements without cost to the City and hereby agrees to satisfactorily complete the installation of the Improvements in a good, workmanlike, lien-free manner within two (2) years after the date of this Agreement. Further, Developer hereby warrants that the Improvements will be free of defects (normal wear and tear

excepted) for a period of one (1) year after all of the Improvements have been installed and finally accepted by the City (the "Warranty").

Section 2. **Repairs.** Developer and the City agree that all responsibility for repair and maintenance of the Improvements remains with Developer until all of the Improvements have been installed and finally accepted by the City (collectively, "Installation/Acceptance") and the Warranty has expired.

Section 3. **Escrow.** To assure and guaranty (a) the satisfactory and timely Installation/Acceptance of the Improvements, and (b) the Warranty (all as provided in section 1 above), contemporaneously herewith Developer shall deposit into a segregated escrow account (the "Escrow") controlled by Escrow Agent for the amount and in the sum of \$_____ (the "Deposit"), which is the estimated cost of the Improvements, including contingency. Developer shall pay all escrow fees and other charges charged by Escrow Agent in connection with the Escrow. Escrow Agent hereby acknowledges the Deposit and the establishment of the Escrow, and hereby irrevocably agrees to hold and disburse the Deposit only in accordance with the express terms of this Agreement.

Section 4. **Release of Deposit.** If an element of the Improvements (i.e., storm drain, roadway, parks and open space and/or culinary and irrigation water) has been constructed to the reasonable satisfaction of the City, then the City will release fifty percent (50%) of the Deposit that is associated with such element. Upon Installation/Acceptance of an element of the Improvements, the City will release twenty-five (25%) of the Deposit that is associated with such element. Further, if one (1) year after final Installation/Acceptance of the Improvements, the Improvements are then free of defects, normal wear and tear excepted, the City will release the remaining amount of the Deposit.

Section 5. **Failure to Install Improvements.** If (a) Installation/Acceptance of the Improvements has not occurred within two (2) years after the date of this Agreement, or (b) the installed Improvements are not free of defects for one (1) year after final acceptance by the City, then the City may unilaterally (without consent or approval of any kind from Developer) at any time thereafter send a written direction to Escrow Agent to release and pay to City the amount (full or any amount) of the Deposit in the Escrow, less any disbursement authorized by the City, whereupon Escrow Agent shall pay such amount to the City within ten (10) days after receipt of such written direction. The City shall be deemed fully authorized (without further action or notice whatsoever) to use as much of the Deposit as is required (in the City's sole opinion) to satisfactorily complete installation of the Improvements and/or to repair any defects therein, including (without limitation) the cost of any and all incidental construction, legal, administrative or engineering fees or expenses incurred by City to effect such work. Any balance of the Deposit remaining after payment of all of such costs, fees and expenses, and retaining a reserve in an amount determined by the City shall be refunded to Developer.

Section 6. **No Waiver or Estoppel.** This Agreement is irrevocable unless revoked by the mutual consent of Developer and the City. Neither this Agreement nor the escrow of the Deposit by Developer and the acceptance of the Deposit or this Agreement by the City shall constitute a waiver or estoppel by or against the City concerning the Improvements, nor shall any

such matters in any way relieve Developer from the obligations to (a) timely achieve satisfactory Installation/Acceptance of the Improvements, or (b) fully perform under the Warranty, all as provided in section 1 above, regardless of whether or not the Deposit is adequate to pay for the satisfactory Installation/Acceptance of the Improvements or the satisfactory fulfillment of the Warranty. If the Deposit is inadequate to pay for the cost of Improvements for whatever reason, Developer agrees to pay such deficiency independent of this Agreement which amount may include any and all incidental construction, legal, administrative or engineering fees or expenses incurred by the City to effect such work. Additionally, no further permits or approvals shall be issued with respect to the Subdivision or to the Developer until such deficiency is cured.

Section 7. **Limitation on Escrow Agent's Duties.** Escrow Agent shall have no duty, responsibility or liability whatsoever to effect the physical installation of the Improvements. Instead, Escrow Agent's only duty hereunder is to hold and distribute the Deposit in the Escrow in accordance with the terms and provisions of this Agreement provided, however, Escrow Agent shall be responsible and/or liable for disbursements of the Deposit that occur without the written direction of the City as provided in section 4 hereof.

Section 8. **Inspection.** The City shall have the right to inspect Improvements during construction. The Developer shall notify the City in writing when underground improvements are ready to be backfilled and agrees not to backfill such trenches or excavations until such underground improvements have been inspected by the City.

Section 9. **General Provisions.** The following provisions are also an integral part of this Agreement:

(a) **Binding Agreement.** This Agreement shall be binding upon and shall inure to the benefit of the successors and assigns of the respective parties hereto.

(b) **Captions.** The headings used in this Agreement are inserted for reference purposes only and shall not be deemed to define, limit, extend, describe, or affect in any way the meaning, scope or interpretation of any of the terms or provisions of this Agreement or the intent hereof.

(c) **Counterparts.** This Agreement may be signed in any number of counterparts with the same effect as if the signatures upon any counterpart were upon the same instrument. All signed counterparts shall be deemed to be one original.

(d) **Severability.** The provisions of this Agreement are severable, and should any provision hereof be void, voidable, unenforceable or invalid, such void, voidable, unenforceable or invalid provision shall not affect the other provisions of this Agreement.

(e) **Waiver of Breach.** Any waiver by either party of any breach of any kind or character whatsoever by the other, whether such be direct or implied, shall not be construed as a continuing waiver of, or consent to any subsequent breach of this Agreement.

(f) Cumulative Remedies. The rights and remedies of the parties hereto shall be construed cumulatively, and none of such rights and remedies shall be exclusive of, or in lieu or limitation of any other right, remedy or priority allowed by law.

(g) Amendment. This Agreement may not be modified except by an instrument in writing signed by the parties hereto.

(h) Interpretation. This Agreement shall be interpreted, construed and enforced according to the substantive laws of the state of Utah.

(i) Attorneys' Fees. In the event any action or proceeding is brought by either party regarding this Agreement, the prevailing party shall be entitled to recover its costs, expert witness fees, and reasonable attorneys' fees, whether such sums are expended with or without suit, at trial or on appeal.

(j) Notice. Any notice or other communication required or permitted to be given hereunder shall be deemed to have been received (a) upon personal delivery or actual receipt thereof or (b) within two (2) days after such notice is deposited in the United States mail, postage prepaid and certified and addressed to the respective addresses set forth herein or to such other address(es) as may be supplied by a party to the other from time to time in writing.

(k) Time of Essence. Time is the essence of this Agreement.

(l) Assignment. Developer may not assign or otherwise convey its rights or delegate its duties under this Agreement without the express written consent of the City.

(m) No Partnership. City and Developer do not by this Agreement in any way or for any purpose become partners or joint venturers with each other.

(n) Benefit of Agreement. The benefits and protection provided by this Agreement shall inure solely to the City. City shall not be liable for any claim or obligation of Developer. City may, in its sole and absolute discretion, interplead the Deposit (full or any amount thereof) with a court pursuant to Utah R. Civ. P. 67 and Utah Code Ann. § 76-27-4.

(o) Exhibits. All exhibits annexed to this Agreement are expressly made a part of this Agreement as though completely set forth herein. All references to this Agreement, either in this Agreement itself or in any such writings, shall be deemed to refer to and include the Agreement and all exhibits and writings.

DATED effective the date first above written.

DEVELOPER:

By: _____
Its: _____
Address: _____

The Escrow Agent hereby acknowledges that there are funds in the amount of \$ _____ that have been set aside pursuant to this Agreement for payment of the Improvements, and Escrow Agent agrees to hold such funds in trust and dispose of such funds strictly in accordance with the terms and conditions of this Agreement.

ESCROW AGENT:

(Print Name)
By: _____
Its: _____
Address: _____

HERRIMAN CITY:

ATTEST:

By: _____
Kristi Peterson, Recorder

By: _____
J. Lynn Crane, Mayor

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____, 20____, by _____, as the _____ of _____.

My Commission Expires:

Notary Public
Residing at: _____

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by _____, as the _____
of _____.

My Commission Expires:

Notary Public

Residing at: _____

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by **J. LYNN CRANE** and **KRISTI PETERSON**, the Mayor and the Recorder,
respectively, of the **CITY OF HERRIMAN**, a Utah municipality.

My Commission Expires:

Notary Public

Residing at: 13011 South Pioneer Street
Herriman, UT 84096

Exhibit "A"
to Bond Agreement for
Completion of Proposed Improvements

[legal description]

Exhibit "B"
to Bond Agreement for
Completion of Proposed Improvements
[Improvements and Cost Allocation Schedule]

**Bond Agreement for Completion
of Proposed Improvements
(Irrevocable Letter of Credit Form)**

THIS BOND AGREEMENT (this "*Agreement*") is made and entered into effective ____, 200__, by and between **HERRIMAN**, a municipal corporation of the State of Utah whose address is 13011 South Pioneer Street, Herriman, Utah 84065 (the "*City*"), and the undersigned owner (or soon to be owner) of real property located within the City (referred to in this Agreement as "*Developer*").

RECITALS :

A. Developer owns, or will soon own, legal title to the real property (the "*Property*") described on exhibit "A" annexed hereto.

B. Developer has filed, or soon will file, an application (the "*Application*") with the City for approval of the subdivision known as or to be known as _____ ("*Subdivision*").

C. Developer has requested that the City allow the Owner to proceed with subdivision plat recording before completion of Improvements (the "*Improvements*") required as a condition precedent to subdivision plat recording. The Improvements are described on exhibit "B" annexed hereto.

D. The City is willing to permit the recording of the final plat for the Subdivision conditioned on Developer's promise to install the Improvements as specified in this Agreement, and on Developer's deposit with the City of an irrevocable letter of credit in an amount equal to the estimated construction cost of the Improvements to be held as specified in this Agreement.

E. The parties intend to set forth herein their entire agreement regarding the Improvements, and to supercede hereby and to consolidate herein all of their prior negotiations and agreements, whether oral or written, regarding the same.

AGREEMENT :

NOW, THEREFORE, in consideration of the recitals above, the mutual covenants and undertakings of the parties hereto, and for other good and valuable consideration, the receipt and legal sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

Section 1. **Developer's Completion and Warranty Obligations.** Developer irrevocably acknowledges its obligation to install the Improvements without cost to the City and hereby agrees to satisfactorily complete the installation of the Improvements in a good, workmanlike, lien-free manner within two (2) years after the date of this Agreement. Further, Developer hereby warrants that the Improvements will be free of defects (normal wear and tear excepted) for a period of one (1) year after all of the Improvements have been installed and finally accepted by the City (the "*Warranty*").

Section 2. **Repairs.** Developer and the City agree that all responsibility for repair and maintenance of the Improvements remains with Developer until all of the Improvements have been installed and finally accepted by the City (collectively, "*Installation/Acceptance*") and the Warranty has expired.

Section 3. **Deposit.** To assure and guaranty (a) the satisfactory and timely Installation/Acceptance of the Improvements, and (b) the Warranty, Developer shall contemporaneously herewith deposit with the City an irrevocable letter of credit dated _____, issued by _____ ("*Issuer*"), number _____ in the principal amount of \$ _____ (collectively referred to as the "*Letter of Credit*" or "*Deposit*"), which is annexed hereto as exhibit "C." The amount of the Deposit is the estimated cost of the Improvements, including contingency.

Section 4. **Assignment of Letter of Credit.** Developer hereby assigns, transfers and sets over to the City all of Developer's right, title and interest in and to the Letter of Credit and all proceeds of the Letter of Credit, and also hereby assigns, transfers and sets over to the City the right to demand and collect from the Issuer of the Letter of Credit the full proceeds thereof, in the event of any default or non-compliance in the performance for which this bond is posted and filed.

Section 5. **Release of Deposit.** If an element of the Improvements (i.e., storm drain, roadway, parks and open space and/or culinary and irrigation water) has been constructed to the reasonable satisfaction of the City, then the City will release fifty percent (50%) of the Deposit that is associated with such element. Upon Installation/Acceptance of an element of the Improvements, the City will release twenty-five (25%) of the Deposit that is associated with such element. Further, if one (1) year after final Installation/Acceptance of the Improvements, the Improvements are then free of defects, normal wear and tear excepted, the City will release the remaining amount of the Deposit.

Section 6. **Failure to Install Improvements/Failure of Warranty.** If (a) Installation/Acceptance of the Improvements has not occurred within two (2) years after the date of this Agreement, or (b) the installed Improvements are not free of defects (normal wear and tear excepted) for one (1) year after final acceptance by the City, then the City may unilaterally (without consent or approval of any kind from Developer) at any time thereafter may demand and receive from the Issuer the (remaining or full) amount of the Deposit (full or any amount). The City shall be deemed fully authorized (without further action or notice whatsoever) to use as much of the proceeds of the Letter of Credit as is required (in the City's sole opinion) to satisfactorily complete installation of the Improvements and/or to repair any defects therein, including (without limitation) the cost of any and all incidental construction, legal, administrative or engineering fees or expenses incurred by the City to effect such work. Any balance of the proceeds of the Letter of Credit remaining after payment of all of such costs, fees and expenses, and a reasonable reserve, in an amount determined by the City, shall be refunded to Developer.

Section 7. **No Waiver or Estoppel.** This Agreement is irrevocable unless revoked by the mutual consent of Developer and the City. Neither this Agreement nor deposit of the Letter of credit by Developer and the acceptance of the Letter of Credit or this Agreement by the City shall

constitute a waiver or estoppel by or against the City concerning the Improvements, nor shall any such matters in any way relieve Developer from the obligations to (a) timely achieve satisfactory Installation/Acceptance of the Improvements, or (b) fully perform under the Warranty, regardless of whether or not the Deposit is adequate to pay for the satisfactory Installation/Acceptance of the Improvements or the satisfactory fulfillment of the Warranty. If the Deposit is inadequate to pay for the cost of Improvements for whatever reason, Developer agrees to pay such deficiency independent of this Agreement which amount may include any and all incidental construction, legal, administrative or engineering fees or expenses incurred by the City to effect such work. Additionally no further permits or approvals shall be issued with respect to the Subdivision or to the Developer until such deficiency is cured.

Section 8. **Limitation on Issuer's Duties.** The Issuer of the Letter of Credit has no duty, responsibility or liability whatsoever to effect the physical installation of the Improvements. Instead, Issuer's only duty hereunder is to hold and distribute the Deposit in accordance with the terms and provisions of this Agreement provided, however, such Issuer shall be responsible and/or liable for disbursements of the Deposit that occur without the written direction of the City.

Section 9. **Inspection.** The City shall have the right to inspect Improvements during construction. The Developer shall notify the City in writing when underground improvements are ready to be backfilled and agrees not to backfill such trenches or excavations until such underground improvements have been inspected by the City.

Section 10. **General Provisions.** The following provisions are also an integral part of this Agreement:

(a) **Binding Agreement.** This Agreement shall be binding upon and shall inure to the benefit of the successors and assigns of the respective parties hereto.

(b) **Captions.** The headings used in this Agreement are inserted for reference purposes only and shall not be deemed to define, limit, extend, describe, or affect in any way the meaning, scope or interpretation of any of the terms or provisions of this Agreement or the intent hereof.

(c) **Counterparts.** This Agreement may be signed in any number of counterparts with the same effect as if the signatures upon any counterpart were upon the same instrument. All signed counterparts shall be deemed to be one original.

(d) **Severability.** The provisions of this Agreement are severable, and should any provision hereof be void, voidable, unenforceable or invalid, such void, voidable, unenforceable or invalid provision shall not affect the other provisions of this Agreement.

(e) **Waiver of Breach.** Any waiver by either party of any breach of any kind or character whatsoever by the other, whether such be direct or implied, shall not be construed as a continuing waiver of, or consent to any subsequent breach of this Agreement.

(f) Cumulative Remedies. The rights and remedies of the parties hereto shall be construed cumulatively, and none of such rights and remedies shall be exclusive of, in lieu of or a limitation of any other right, remedy or priority allowed by law.

(g) Amendment. This Agreement may not be modified except by an instrument in writing signed by the parties hereto.

(h) Interpretation. This Agreement shall be interpreted, construed and enforced according to the substantive laws of the state of Utah.

(i) Attorneys' Fees. In the event any action or proceeding is brought by either party regarding this Agreement, the prevailing party shall be entitled to recover its costs, expert witness fees, and reasonable attorneys' fees, whether such sums are expended with or without suit, at trial or on appeal.

(j) Notice. Any notice or other communication required or permitted to be given hereunder shall be deemed to have been received (a) upon personal delivery or actual receipt thereof or (b) within two (2) days after such notice is deposited in the United States mail, postage prepaid and certified and addressed to the respective addresses set forth herein or to such other address(es) as may be supplied by a party to the other from time to time in writing.

(k) Time of Essence. Time is the essence of this Agreement.

(l) Assignment. Developer may not assign or otherwise convey its rights or delegate its duties under this Agreement without the express written consent of the City.

(m) No Partnership. The City and Developer do not by this Agreement in any way or for any purpose become partners or joint venturers with each other.

(n) Benefit of Agreement. The benefits and protection provided by this Agreement shall inure solely to the City. The City shall not be liable for any claim or obligation of Developer. City may, in its sole and absolute discretion, interplead the Deposit (full or any amount thereof) with a court pursuant to Utah R. Civ. P. 67 and Utah Code Ann. § 76-27-4,

(o) Exhibits. All exhibits annexed to this Agreement are expressly made a part of this Agreement as though completely set forth herein. All references to this Agreement, either in this Agreement itself or in any such writings, shall be deemed to refer to and include the Agreement and all exhibits and writings.

DATED effective the date first above written.

DEVELOPER:

By: _____
Its: _____
Address: _____

The Issuer hereby acknowledges that the Letter of Credit has been issued pursuant to this Agreement and hereby irrevocably agrees to hold the Letter of Credit in trust and disburse such funds strictly in accordance with the terms and conditions of this Agreement.

ISSUER:

Name of Issuer: _____
(Print Name of Issuer)
By: _____
Its: _____
Address: _____

HERRIMAN CITY:

ATTEST:

By: _____
Kristi Peterson, Recorder

By: _____
J. Lynn Crane, Mayor

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by _____, as the _____
of _____.

My Commission Expires:

Notary Public

Residing at: _____

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by _____, as the _____
of _____.

My Commission Expires:

Notary Public

Residing at: _____

STATE OF UTAH)
 : ss.
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this ____ day of _____,
20____, by **J. LYNN CRANE** and **KRISTI PETERSON**, the Mayor and the Recorder,
respectively, of the **CITY OF HERRIMAN**, a Utah municipality.

My Commission Expires:

Notary Public

Residing at: 13011 South Pioneer Street
Herriman, UT 84096

Exhibit "A"
to Bond Agreement for
Completion of Proposed Improvements

[legal description]

Exhibit "B"
to Bond Agreement for
Completion of Proposed Improvements
[Improvements]

Exhibit "C"
to Bond Agreement for
Completion of Proposed Improvements

[Letter of Credit]
(Cannot expire before 36 months from the
date of this Agreement)

