PART VIII - LANDSCAPE & IRRIGATION

POLICIES AND DESIGN CRITERIA

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CITY OF WEST JORDAN
Engineering Department
8000 South Redwood Road
West Jordan, Utah 84088

PART VIII - LANDSCAPE & IRRIGATION
POLICIES AND DESIGN CRITERIA MANUAL

ABBREVIATED
TABLE OF CONTENTS

DETAILED
TABLE OF CONTENTS

DETAILED
TABLE OF CONTENTS

DETAILED
TABLE OF CONTENTS

SECTION 1.0

INTRODUCTION AND GENERAL POLICIES

1.1 SCOPE

The City of West Jordan, Landscape & Irrigation Policies and Design Criteria Manual, establishes uniform minimum policies and procedures for the design and construction of City landscaping, irrigations systems, parkstrips, parks & trails and appurtenances. It is not the intent of this manual that any standard of conduct or duty toward the public shall be created or imposed by publication of this manual. This manual is not a substitute for engineering or landscape architect, or other associated professional knowledge, experience or judgment. This manual is neither designed as, nor does it establish, a legal standard for these functions. The methods and procedures contained herein shall be reviewed by the Engineer/Architect or other design professional using them to see that they are applicable to the project on which he/she is working. Where not considered applicable, the Engineer, Architect, or other design professional shall request a variance from these standards as provided in this manual.

The design and construction of parkstrips, parks, and trails and other appurtenances in City of West Jordan landscape, irrigation systems, parkstrip, parks & trails systems shall comply with these minimum standards herein called "Landscape & Irrigation Policies & Design Criteria Manual", or the permit requirements of various governing bodies, except where specific modifications have been approved, in writing, by the City Engineer. All submitted plans shall be stamped and signed by a civil engineer, registered in the State of Utah, or by other design professional performing professional design work requiring their designs, studies, and contract documents to be stamped and signed, and all work shall be in accordance with good engineering and or other professional practices.

This document sets forth the minimum procedure for designing and preparing plans and specifications for parkstrips, parks and trails built for the City, or ones which will be dedicated to the City. Wherever there are differences between these standards and other county, state or federal regulations, the most stringent or highest requirement shall govern. The design criteria and standard drawings contained in this document are for parkstrips, parks & trails only. The City has also prepared policies & design criteria manuals for other infrastructure which are operated and maintained by the City. The developer/developer's engineer/architect or other design professional shall obtain the other manuals to determine how to design these other policies & design criteria manuals for these other facilities from the Engineering Department.

1.2 AUTHORITY

Titles 72, 74, 81, 86, 87, 89, and 90 of the City of West Jordan Municipal Code, establishes the legal authority for the planning, design and construction of the City's parkstrips, parks and trails systems and appurtenances. Title 89, Chapter 6, PART 7. Landscaping provide specific requirements regarding various landscaping and irrigation systems in the City.

1.3 DESIGN PROFESSIONAL 'S RESPONSIBILITIES

These standards have been prepared and adopted to provide a minimum set of standards to be used in the design and construction of parkstrips, parks and trails in the City. The design professional preparing various studies, master plans, designs, specifications, drawings, and other documents for facilities to be constructed in the City, bears the full responsibility the work he/she performs in relation to their work. By affixing your stamp and signature to these documents, you accept the full responsibility for defects, difficulties or repairs, necessary as a result of a defective design. The preparation and publication of this manual shall not be construed as indicating the City has designed the projects, or has directed the design, so as to remove the responsibility of the design professional and place it upon the City.

1.4 INTERPRETATION

The City Engineer shall decide all questions of interpretation of "good engineering or other professional practices" being guided by the various standards and manuals at the discretion of the City Engineer.

1.5 QUALITY ASSURANCE

A. All Landscape plans shall be designed by a licensed Landscape Architect and shall conform to the City's *Public Improvement Standards, Specifications, and Plans* manual.

B. Irrigation systems shall be designed by a person certified by the National Irrigation Association or by a licensed Landscape Architect and shall conform to the City's *Public Improvement Standards, Specifications, and Plans* manual.

C. All work shall be performed in accordance with City drafting/submittal requirements as described herein. Civil design work shall be accomplished under the direct supervision of a Utah Registered Professional Engineer or other design professional with at least 5 years of experience in conducting design, studies and shall carry the seal of the same supervising Professional Engineer or other design professional. All submitted designs, specifications, reports and plans shall be signed by a civil engineer, registered in the State of Utah, or other design professional, and all work shall be in accordance with good engineering or other professional practice of that particular industry.

1.6 SUBMITTALS

A. Landscape Plans - All Landscape Plans shall contain the following information.
   1. The location and dimensions of all existing and proposed buildings and structures, property lines, easements, parking lots and drives, streets and rights-of-way, sidewalks, signs, dumpster enclosures, fences, and other site features as determined necessary by the Zoning Administrator.
   2. The location of all proposed plants and a Plant Schedule specifying the quantity, size, common name, botanical name, and spacing of all proposed plants.
   3. The location, size, and common names of all existing plants on the site, including trees and other plants in the parkway, indicating plants to be retained and those that will be removed.
   4. The location of existing buildings, structures and plants within twenty feet of the site.

5. Existing and proposed landscape grading of the site indicating contours at two-foot intervals. Proposed berming shall be indicated using one-foot contour intervals.
6. Elevations of all proposed fences and retaining walls on the site.
7. Summary data indicating:
   a. the total area and percentage of the site that will be landscaped;
   b. the area and percentage of landscaping that will be planted in domestic turf grasses; and
   c. The percentage of water-conserving trees, shrubs, perennials, and groundcover species that will be planted.

B. Irrigation Plans - When a site is required to be landscaped under the terms of this Part, a permanent irrigation system shall be installed to help insure survival of plants. Irrigation Plans shall be drawn at the same scale as the Planting Plan and shall contain the following minimum information:
   1. Layout of the irrigation system and a legend summarizing the type and size of all components of the system, including manufacturer name and model numbers.
   2. Static water pressure in pounds per square inch (psi) at the point of connection to the public water supply.
   3. Flow rate in gallons per minute and design operating pressure in psi for each valve.
   4. Precipitation rate in inches per hour for each irrigation zone.

C. Project Documents - Meet all checklist items required by Engineering Department before document submission.

D. Easements, Land Acquisition, and Permits
   1. All easements and land acquisitions shall be submitted on the city's standard easement form and/or shall be included on the recorded subdivision plat.
   2. One copy of all necessary easement forms shall be submitted to the City Engineer for review.
   3. All necessary permits shall be submitted to the City Engineer for final approval. Required permits include but are not limited to state and county utility line permits, canal crossing permits, railroad crossing permits, Army Corp. of Engineer permits, etc.
   4. All necessary permits and easements must be submitted prior to final approval being granted by the City.

E. Soils Report – The City Engineer will determine whether a soils report is required for the project. If construction includes parking lots and or roads, the design professionals shall refer to the Road & Bridge Policies and Design Criteria Manual for guidance on how to proceed.

F. Traffic Impact Study - The City Engineer will determine whether a traffic impact study is required for the project.

G. Project Documents - Meet all checklist items required by Engineering Department before document submission.

1.7 DEFINITIONS AND TERMS

Whenever in these specifications or in any document or instruments where these specifications govern, the following terms, abbreviations or definitions are used, the intent and meaning shall be interpreted as follows:

ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
A.B.	Aggregate Base
A.S.B.	Aggregate Subbase
A.C.	Asphaltic Concrete Type A
ACI	American Concrete Institute
ADT	Average Daily Traffic in vehicles per 24 hours
ANSI	American National Standards Institute
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
EP	Edge of pavement
ES	Edge of shoulder
ETo	Evapotranspiration
ITE	Institute of Transportation Engineers
P.C.C.	Portland Cement Concrete
	Structures Class A (6 sack)
	Pavement Minimum Class B (5 sack)
	Curb, gutters, driveways and walks Class B (5 sack)
	Higher classes shown on plans will govern
PUE	Public Utility Easement
PW	Public Works Department
TIS	Traffic Impact Study
TYP	Typical
UBC	Uniform Building Code
UPC	Uniform Plumbing Code

Symbols

C	Centerline
ROW	Right of way line
FL	Flow line
PL	Property line
"R"	Value
≥	Equal to or greater than
≤	Equal to or less than

DEFINITIONS

"Acceptance" Field acceptance is when the Engineering Department inspector approves the physical installation of the water system. The City Engineer acceptance or final acceptance follows field acceptance and is when the City Engineer approves both physical improvements as well as the administrative items associated with development, and the General Services Department accepts ownership and operations and maintenance responsibilities.

"Access or Access Connection"	Any driveway or other point of entry and or exit such as a street, road or highway that connects to the general street system. Where two public roads intersect, the secondary roadway shall be considered the access.
"Approved"	Unless specifically otherwise indicated, this shall mean approval by the City Engineer.
"Base Flood Elevation"	A base flood elevation (BEE) is the depth of the based flood, usually in feet, above the ground surface.
"Base Course"	Compacted material supporting subsequent construction.
"Bench Mark"	A surveyors reference point for establishing grade elevations and property line position.
"Binder Course"	An intermediate course, usually composed of asphalt, aggregate and mineral dust, placed between the base course and surface course.
"Bubbler"	An irrigation head that delivers water to the root zone by "flooding" the planted area, usually measured in gallons per minute. Bubblers exhibit a trickle, umbrella or short stream pattern.
"Building"	A permanently located structure having a roof supported by columns or walls for the shelter, housing, or enclosure of any person, animal, article, or chattel.
"Building Pad"	The designated and identified site working surface which can be a cut surface or a filled and compacted surface.
"Capital Project"	An organized undertaking which provides, or is intended to provide, the City with a capital asset. "Capital Asset" is defined according to generally accepted accounting methods.
"City"	City of West Jordan, Utah
"City Engineer"	City Engineer shall mean the City Engineer of City of West Jordan, or the person(s) engaged by the City and authorized to perform the duties assigned to the City Engineer, and shall include any deputies and representatives.
"Common Fill"	Usually excavated inorganic subsoil or topsoil materials.
"Contours"	The lines drawn on site plans indicating the elevations of grading and contouring of the site topography.
"Corner Clearance"	The distance from the driveway approach to the edge of the traveled way at an intersection. This is measured along the top back of the curb beginning at the end of the curb return radius for the driveway

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	and ending at the extension of the top back of curb of the intersecting street.
"County"	Salt Lake County, Utah.
"Current Normal Flow Boundary"	The area within which water flows under normal conditions.
"Developer"	An individual or organized group; partnership, corporation, etc.; proposing to subdivide or improve land which will require culinary water from the City's system.
"Developer's Engineer"	The engineer licensed by the State of Utah as a civil engineer, employed by the developer, under whose direction construction plans, profiles and details of the work are prepared and submitted to the City for review and approval.
"Distribution Uniformity"	The measurement of the amount of water beneficially applied, divided by the total amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system hardware characteristics and management practices.
"Drip Emitter"	Drip irrigation fittings that deliver water slowly at the root zone of the plant, usually measured in gallons per hour.
"Easement"	A recorded document in which the landowner gives the City permanent rights to construct and maintain public facilities across private or other property.
"Edge of Bank"	The top edge of the highest channel bank or the edge of the highest point of the current normal flow boundary, whichever is greater.
"Engineer"	A professional engineer or firm of professional civil engineers appointed by and acting for the Engineering Department in the case of a City sponsored capital project. In the case of a developer-sponsored project, the term refers to the engineer hired by the developer and may also be referred to as "developer's engineer".
"Engineering Department"	The City department responsible for planning, designing and construction of the City's roadways and bridges, culinary water, secondary water and storm drainage systems.
"Evapotranspiration"	The quantity of water evaporated into the air from adjacent soil surfaces and transpired by plants during a specific time, expressed in inches per day, month or year.
"Fill"	Placed soil or aggregate material, native to site or imported.

"Fire Department"	City of West Jordan Fire Department.
"Floodplain"	The areas adjoining a watercourse at or below the water surface elevation associated with the regional flood that have been or hereafter may be covered by the regional flood.
"Floodway"	The channel of a watercourse and those portions of the adjoining floodplains which are required to carry and discharge the 100-year flood with no significant increase in the base flood elevation.
"Floodway Fringe"	Those portions of the floodplain, other than the floodway, which can be filled, leveed, or otherwise obstructed without causing substantially higher flood levels or flow velocities. Floodway fringes serve as temporary storage for floodwaters.
"Fixed Spray Sprinkler"	An irrigation head that sprays water through a nozzle.
"Grading Plan"	The Grading Plan shall be shown at the same scale as the Planting and Irrigation Plan. The Grading Plan shows all finish grades, spot elevations as necessary and existing and new contours with the developed landscaped area.
"Ground Cover"	Material planted in such a way as to form a continuous cover over the ground that can be maintained at a height not more than twelve (12) inches.
"Hardscape"	Patios, decks and paths. Does not include driveways and sidewalks.
"Inspector"	An employee or agent of the City engaged to observe and record field compliance with design criteria, plans and construction standards.
"Irrigated Landscaped Area"	All portions of a development site to be improved with planting and irrigation. Natural open space areas shall not be included in the Irrigated Landscape Area.
"Irrigation Contractor"	A person who has been certified by the Irrigation Association (IA) to install irrigation systems.
"Irrigation Designer"	A person authorized by Utah state law to prepare irrigation plans, includes Landscape Architects, Architects, Engineers, Land Surveyors, and Landscape Contractors.
"Irrigation Plan"	The irrigation plan shall be shown at the same scale as the planting plan. The irrigation plan shall show the components of the irrigation system with water meter size, backflow prevention, precipitation rates, flow rate and operating pressure for each irrigation circuit, and identification of all irrigation equipment.

"Landscape Architect"	A person who is licensed by the State of Utah to practice landscape architecture.
"Landscape Designer"	A Landscape Architect, Professional Engineer, Land Surveyor, or Architect, as set forth by State law.
"Landscape Irrigation Auditor"	A person who has been certified by the Irrigation Association to conduct landscape irrigation audit (known as "CLIA" certification).
"Landscape Plan"	The preparation of a graphic and written criteria, specifications, and detailed plans to arrange and modify the effects of natural features such as plantings, ground and water forms, circulation, walks and other features to comply with the provisions of the City's ordinances.
"Landscape Water Allowance"	For design purposes, the upper limit of annual applied water for the established landscaped area. It is based upon the local Reference Evapotranspiration Rate (ETO), the ETO adjustment factor and the size of the landscaped area.
"Landscape Zone"	A portion of the landscaped area having plants with similar water needs, areas with similar microclimate (i.e., slope, exposure, wind, etc.) and soil conditions, and areas that will be similarly irrigated. A landscape zone can be served by one irrigation valve, or a set of valves with the same schedule.
"Limit of Rough Grading"	The dimensional limits are usually identified on the site plan.
"Maintenance Road"	An asphalt-paved road that is a minimum of 12-feet wide and used as access for the maintenance of trails, drainage channels, and vegetative buffers.
"Mulch"	Any material such as bark, wood chips or other materials left loose and applied to the soil.
"Natural Drainage Channel"	A natural stream which conveys surface runoff water within well-defined banks. Improved channels can be plain earth, landscaped, or lined with stone, rock, or any other approved hard surface to resist erosion and scour.
"Natural Drainage Course"	Those areas, varying in width, along streams, creeks, gullies, springs, or washes which are natural drainage channels.
"Natural Vegetation Buffer Zone"	A buffer zone between a natural drainage channel and any man made structure that consists of natural vegetation. Natural vegetation is defined as plant communities that appear not to have been modified by human activities. A length of at least 50-feet on both sides of the

	canal or channel must be present. This is measured from the edge of bank, to the end of the buffer zone.
"Open Space Corridor"	A corridor designed to protect vital open spaces surrounding canal and channel flow areas and provide City residents with recreational opportunities. At length of at least 50-feet on both sides of the canal or channel must be present. This is measured from edge of bank to the end of the corridor.
"Park"	A playground or other area or open space providing opportunities for active or passive recreational or leisure activities.
"Parks, Recreation & Trails Master Plan"	A plan adopted by West Jordan City that develops a unified transportation system that provides for the economic, efficient, comfortable, and safe movement of people and goods. The most current plan should be followed.
"Parkstrip"	The area located between a street right-of-way line and the edge of asphalt or curb, but not including driveways, sidewalks, or trails.
"Path, Equestrian"	A pathway, which may be paved or unpaved, and is physically separated from motorized vehicular traffic by an open space or barrier and is either within the roadway right-of-way or within an independent tract, or easement, that is used solely for equestrian uses.
"Path, Multi-Use"	A pathway, which may be paved or unpaved, and is physically separated from motorized vehicular traffic by an open space or barrier and is either within the roadway right-of-way or within an independent tract, or easement. Multi-use path activities may include walking, hiking, jogging, bicycling, and roller-skating.
"Plans"	Drawings of roadways, bridges, water pipelines, reservoirs.
"Planting Plan"	A Planting Plan shall clearly and accurately identify and locate new and existing trees, shrubs, ground covers, turf areas, driveways, sidewalks, hardscape features, and fences.
"Plate No."	Where not specified to the contrary, this refers to plates attached to these standards."
"Precipitation Rate"	The depth of water applied to a given area, usually measured in inches per hour.
"Project Redline Memorandum"	This is a memorandum prepared by City staff which has three main categories of comments: 1) comments made to address Code or Standards requirements, 2) alternatives for Code, standards, manual

	or other Planning Commission or City Council approved requirements, and 3) optional suggestions the Developer and his engineer may consider, and which are not required.
"Public Improvements"	Streets, curb, gutter, sidewalk water and sewer lines, storm sewers, flood control facilities and other similar facilities which are required to be dedicated to the City in connection with subdivision, conditional use, or site plan approval.
"Public Right-of-Way"	Any road, street, court, place, viaduct, tunnel, culvert or bridge laid out or erected as such by the public, or dedicated or abandoned to the public, or made such in any action by the subdivision of real property, and includes the entire area within the right-of-way.
"Public Works Department"	The City department responsible for operations and maintenance of the City's roadways, culinary water, and storm drainage systems.
"Rain Shut-Off Device"	A device wired to the automatic controller that shuts off the irrigation system when it rains.
"Redline"	City staff comments written on drawings, reports, plats, and other documents submitted by the Developer for review, for the project. These are meant to give direction as to what needs to be corrected to make them acceptable to the City for further processing.
"Redline Return"	The redline process consists of an *'Initial or 1st Review'* of a given document, which contains City staff's redlines (comments), which is then followed by a *'Second Review'*, *'Third Review'*, etc., depending on how well the Developer's engineer addresses City staff's redlines. A *'redline return'* is that portion of the process where the Developer returns the correct document from a City review, for additional City staff review.
"Reference Evapotranspiration Rate or ETo"	A standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month or year and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool season grass that is well watered. The average ETo for the Salt Lake Valley is 31.18-inches.
"Released for Construction Drawings"	The Engineering Department has established a set of drawings required for these RFCD. It consists of all of the construction drawings necessary to construct the entire project, including public and private infrastructure such as roadways, water, sewer, storm drain lines, and landscaping & irrigation drawings. This set of drawings is combined into what is referred to as the *'Released for Construction Drawings'*. The purpose of this manual is to describe

	what is necessary to review and approve just the landscaping and irrigation portion of these *'Released for Construction Drawings'*.
"Right of Way"	Land set aside for public ingress and egress. Typically 1 foot behind the sidewalk to 1 foot behind an opposing sidewalk.
"Required"	Unless specifically otherwise indicated, this shall mean a requirement of the City Engineer.
"Runoff"	Irrigation water that is not absorbed by the soil or landscape area to which it is applied and which flows onto other areas.
"Semi-Natural Vegetation Buffer Zone"	A buffer zone between a natural drainage channel and any man made structure that consists of semi-natural vegetation. Semi-natural vegetation means plant communities where the structure of vegetation has been changed through human activities, but where the species composition is undoubtedly native and the structure of the vegetation conforms to the structure of presumed natural vegetation. The use of a semi-natural vegetation buffers must be approved by Planning Staff, and may only occur in the situation where natural vegetation needs to be restored after previous destruction. A length of at least 50-feet on both sides of the canal or channel must be present. This is measured from edge of bank to the end of the buffer zone.
"Setback"	The minimum distance required between a man-made structure and a watercourse. This distance is measured from the edge of bank to the man-made structure.
"Staff Engineer"	A registered civil engineer employed by the City and designated by the City Engineer to act on the City's behalf.
"Sidewalk"	A passageway or pathways for pedestrians, excluding motor vehicles.
"Spray Sprinkler"	An irrigation head that sprays water through a nozzle.
"Stockpile Area"	A portion of the site designated to store fill materials. The limits of rough grading noted on site drawings are appropriate to describe exact limits of rough grading.
"Stream Rotor Sprinkler"	An irrigation head that projects water through a gear rotor in single or multiple streams.
"Street, Public"	A right-of-way which has been dedicated to the City and accepted by the City Council, or which the City has acquired by prescriptive right, deed or by dedication, or a thoroughfare which has been made

	public by use and which affords access to abutting property, including highways, roads, lanes, avenues and boulevards.
"Structural Fill"	Place soil or aggregate material, native to site or imported, used above the subgrade surface to support elements above.
"Subbase"	Compacted material supporting the base course.
"Subgrade"	The lowest elevation upon which fill or other work will be placed.
"Surface Course"	Traffic bearing top course over placed fills, when no wearing course is used, usually associated with pavement work.
"Top of Bank"	The line formed by the intersection of the general plane of the sloping side of the watercourse with the general plane of the upper generally level ground along the watercourse; or, if the existing sloping side of the watercourse is steeper than the angle of repose (critical slope) of the soil or geologic structure involved, "top of the bank" shall mean the intersection of a plane beginning at the toe of the bank and sloping at the angle of repose with the generally level ground along the watercourse. The angle of repose is assumed to be 1.5 (horizontally): 1 (vertical) unless otherwise specified by a geologist or soils engineer with knowledge of the soil or geologic structure involved.
"Topsoil"	Excavated or imported earth material that encourages plant growth.
"Topsoil Analysis"	A report of a soils laboratory indicating soil type(s), soil depth, uniformity, composition, bulk density, infiltration rates, and pH for the top soils and subsoil for a given site. The soils report also includes recommendations for soil amendments.
"Trail"	A path, hard or soft surfaced, intended for public use for recreation and/or alternative transportation methods, and which may provide access to City, State, or Federal open lands or recreation areas. This may include pedestrians, equestrians, and cyclists using non-motorized bicycles.
"Tree, Street"	An approved tree placed either within or adjacent to the City's public right-of-way. Street trees are considered a public improvement.
"Turf"	A surface layer of earth containing mowed grass with its roots.
"Utilities"	Includes culinary water lines, pressure and gravity irrigation lines, sanitary sewer, and flood control facilities, electric power, natural gas, cable television and telephone transmission lines, underground conduits and junction boxes.

"Water-conserving Plant"	A plant that can generally survive without irrigation throughout the year once established, although supplemental water may be desirable during drought periods for improved appearance and disease resistance.
"Water Audit"	An on-site survey and measurement of irrigation equipment and management efficiency, and the generation of recommendations to improve efficiency.
"Wildlife Corridor"	A corridor designed to provide a safe and natural area for animal habitat and migration along canal and channel flows. A length of at least 50-feet on both sides of the canal or channel must be present. This is measured from edge of bank to the end of the corridor.

1.8 APPLICABLE CODES, MANUALS AND POLICIES

A. Ordinances and Codes - Ordinances, requirements and applicable standards of governmental agencies having jurisdiction within the City's service area shall be observed in the design and construction of roadways. Such requirements include but are not limited to current revisions of the following:
   1. Municipal Code of City of West Jordan
   2. Road encroachment regulations of City of West Jordan, State of Utah, Salt Lake County, as applicable.
   3. Manual of Standard Specifications, 1997 Edition, American Public Works Association
   4. Manual of Standard Plans, American Public Works Association

   A complete listing of all reference material is included in the back of these standards.

B. Parks, Recreation and Trails Master Plan
   1. General – The City's adopted Parks, Recreation and Trails Master Plan establishes goals and policies for parks and trail development within the City. The Goal Statements are:
      a. To provide an integrated, connected and diverse system of parks, recreation programs, and trails that are physically, economically, and socially accessible to community members.
      b. To provide recreation opportunities to City residents equitably, by basing them on adopted guidelines or community preferences.
      c. To maintain communications between administration, public officials, and residents to ensure that recreation faciltieis and programs continue to meet the needs of the community.
      d. To design and construct park and recreation facilities that conserve natural resources such as water, and set an example for the community.
      e. To provide a connected system of trails to serve recreational needs, as well as the needs of the bicycle commuters and pedestrians.
   2. Use of Master Plan – Developers, City staff, design professionals, and others associated with the planning, design and construction of parks, recreation, and trails facilities shall use the master plan as a guiding document to do so. The master plan is to be consulted in the preliminary planning stages of projects to ensure the policies and guidelines set forth in this document are being met.

C. City Manuals – In addition to the Codes indicated above, the City has prepared and adopted the following manuals, which provide additional City requirements and procedures.
   1. Policies and Design Criteria Manuals – The City has prepared Manuals for various other specialties including road & bridge, water, land disturbance, sewer, and storm drainage. Please refer to these manuals for work not specified in this manual.
   2. Development Processing Manual – Describes processes, procedures and requirements for various City processes, i.e. subdivision or site plan processing, for private development projects. It contains detailed, step-by-step processes and requirements for each step to assist developers and their engineers through a particular process.
   3. Private Development Construction Inspection Manual – Prepared to describe the processes and procedures required of all construction inspection of private development projects. In addition to processes and procedures, it also includes various forms and checklists to be used with private development projects.
   4. Capital Improvement Project (CIP) Construction Inspection and Management Manual – Prepared to describe the processes and procedures required of all City CIP projects. In addition to processes and procedures, it also includes various forms and checklists to be used with CIP projects.

1.09 POLICIES

The following policies also apply to private development projects and CIP projects alike. Should you have questions regarding them, please contact the City Engineer or Parks Division of the Public Works Department.

A. Latest Industry Standards & 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.

B. The Parks Division 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. The following items must be completed in order to receive a bond release on the project:
   1. Parks Division must receive a set of detailed plans to be approved by the City before construction is started.
   2. 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.

C. Operation & Maintenance - Operation and maintenance manuals and an "As Built" set of plans must be submitted to the Parks Division before the 5th Inspection can be considered complete. All as built plans must be an accurate computer generated copy of the entire project.

D. Streetscape Size and 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.

E. Construction Specifications - The landscaping construction project shall include, but is not limited to, the furnishing, installing and testing of irrigation mains, (90 PSI for one hour), backflow device and furnishing and installing of water meter(s), flow meters sprinkler heads, bubblers, drip emitters, gate valves, control valves, automatic valves, automatic controllers, field

wiring, topsoil, turf, trees, shrubs, and any metered electrical connection. The removal and/or restoration of existing improvements, excavation and backfill, and all other work shall be in accordance with West Jordan City Standards and Specifications.

F. 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.

G. Signs, Fences, Barricades - The Contractor shall, at all times during construction, maintain safe pedestrian ways around all areas of construction. This may require appropriate signage, fences, barricades or other approved devices as required by the Public Works Department or Parks Division.

H. Inspections - All Contractors are required to follow an inspection schedule as per West Jordan City Standards. Should any of the work be covered or completed before inspections and test, the Contractor will be required to uncover the work at their own expense to meet West Jordan City Standards and Specifications.

I. Ordinances and Regulations - 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 Contractor, Developer and Landscape Architect. However these City Specifications will take precedence over State laws when they describe materials, workmanship or construction of higher standards.

J. 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 100% bond release and only when all requirements contained herein have been met.

K. 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.

L. Irrigation & Planting Materials - All Materials shall conform to specifications indicated in the City's *'Construction Specifications Manual*'.

M. Private versus Public Streets Policy – Please refer to the Road & Bride Policies and Design Criteria Manual for this information.

N. Construction Water Use Policy – All water used for any purpose is to be metered through a City issued meter containing an approved backflow prevention device. Violation of this requirement will make the person and company subject to the City's Municipal Code and its penalties. Check with the City's Engineering Inspector for information on how to obtain the requirement meter.

O. Policy on Irrigation Meters - Where the parkways or side landscaping strips along streets are to be irrigated, a separate meter must be installed on each side of the street. In such cases, running an irrigation line from the meter to the other side of the street is not allowed. Where a median strip must be irrigated, the meter may either be in the side parkway or in the median strip, providing that at either location the meter is easily accessible and protected from being covered by

landscape materials or other obstructions. The Engineering Department reserves the right to select all meter locations. It has been determined that dedicated irrigation meters are not subject to impact fees.

P. Fire Protection within the City - Within City of West Jordan, fire protection is provided by the City of West Jordan Fire Department.

Q. Confined Space Entry Policy - All Developer/Contractor and City staff is subject to the City's Confined Space Entry Program requirements and as such shall meet its requirements. Confined spaces shall not be entered until all requirements of the City's Program have been made and approved by the City's Inspector on the project and all applicable permits have been received. Also of concern is that all "Lock-out, Tag-out" procedures be complied with to provide for a safe working environment for all personnel. Personnel not complying with the City's requirements for these items is subject to penalties.

R. Material/Product Suppliers Approval Process - Materials not indicated in this manual, as being approved for use in the City's parkstrips, parks and trails systems must be approved by the City Engineer. The process for approval of these materials will be as follows:
   1. Material supplier submits a written request to the City Engineer for consideration of the material/product to be considered. The request must contain a letter making the request along with any material/product data sheets the City will need in determining its compatibility in the City's water system.
   2. The City will form a Review Committee comprising of Engineering Department engineers and Public Works Department staff to review, discuss, and evaluate the material's/product's acceptability to the City.
   3. The material/product supplier will be asked to come and make a presentation on their material/product to the City's Review Committee where additional questions will be asked of the supplier. Additional information will be required to be submitted as indicated by the Review Committee.
   4. Based upon all information, the Committee will make a recommendation to the City Engineer for his review and approval.
   5. The City Engineer will make a finding based upon the Committee's information and his own experience and render that decision to the supplier in writing.

1.10 CITY DEPARTMENTS' RESPONSIBILITIES/JURISDICTIONS

A. Engineering Department - The Engineering Department is responsible for the approval of plans and inspection of all public infrastructures, parkstrips, parks and trails within the City's boundaries.

B. Public Works Department - The Public Works Department (PW) is responsible for the operation and maintenance of all public infrastructure, parks, and trails within the City's boundaries. Parkstrip maintenance along residential roadways is the responsibility of the home owner, condominium organization, homeowner's association, or other private organization. The Public Works Department is responsible for operations and maintenance of other specified arterial and collector street parkstrip and median landscaping and plant materials. Please contact the Public Works Department to determine which of these streets this Department maintains.

C. Community Development Department, Building Division - The Building Division is responsible for the residential and commercial building sites after final grade has been reached.

D. Fire Department – The City's Fire Department is charged with providing adequate and proper fire protection for the City and its residents and businesses. As such, they are responsible for reviewing all projects during design, City processing, construction and after construction, for ensuring proper fire protection is design and provided for. They also inspect businesses, water facilities, etc. to ensure they are operating properly.

1.11 DEVELOPER ENGINEER'S RESPONSIBILITY

These standards establish uniform policies and procedures for the design and construction of the City parkstrips, parks and trails. They are not intended to be a substitute for landscape architectural, engineering, or other professional knowledge, judgement or experience. These procedures shall be reviewed by the developer's landscape architect and/or engineer and shall be applied as necessary to the project. Proposed deviations to these standards shall be submitted by the Developer's landscape architect and/or engineer in writing, prior to preliminary plat and or development project approval. If approved, the City Engineer will prepare an approval of the requested change.

It is the Developer and the Developer landscape architect's and/or engineer's responsibility to be aware of the City's Parks, Recreation & Trails Master Plan for park and trails improvements and to indicate any park or trail relocations, extensions or vacations on the preliminary subdivision plat. This responsibility shall include investigating any changes from the Master Plan necessitated by development subsequent to the Master Plan, although the above shall not relieve the developer from the responsibility to provide an approved system consistent with Engineering Department requirements.

The Engineering Department may require that a Traffic Impact Study be completed for the project, depending upon City staff review. The Engineering Department and other City staff will review, comment on, and approve the traffic impact study. Verification of the adequacy of the surrounding roadway system rests jointly with the Engineering Department and the developer.
All plans, specifications, reports or documents shall be prepared by a licensed landscape architect and/or registered civil engineer, or by a subordinate employee under direction of the licensed architect and/or registered civil engineer. Each of these documents shall be signed and stamped with a professional landscape architect and/or engineer seal, to indicate responsibility for them. A wet stamp is required on all documents except reproducible plans, where a stamp on the original is acceptable.

A "Preliminary Review" and or "Released for Construction" stamp or signature of the City on the plans does not in any way relieve the developer's engineer of the responsibility to meet all requirements of the City, or the responsibility for preparing the studies, designs, and other activities associated with these "Released for Construction" drawings and/or other contract documents. The plans shall be revised or supplemented at any time if it is determined that the City's requirements have not been met.

Generally, plans that are signed as being released for construction will not require revisions based upon subsequent revisions to these standards, however, when the Engineering Department's opinion, a change to the project is necessary, based upon a significant change in the standards, which

significantly affects public safety, future maintenance costs, or similar concerns, such a charge may be required during construction by the City Engineer. Changes may also be required in the case where a developer does not proceed to construction within the time allowed in the agreement with the City.

1.12 REFERENCED SPECIFICATIONS

The following documents are referenced specifications for work related to City roadways and appurtenances. References to standards such as AASHTO, APWA or ASTM shall refer to the latest edition or revision of such standards unless otherwise specified.

A. Parks, Recreation & Trails Master Plan dated July 15, 2003. Prepared by Landmark Design, Inc.

1,13 CITY ENGINEER ACCEPTANCE

The City Engineer will not accept the parkstrips, parks and trails systems until all applicable requirements of these standards and of the City of West Jordan Municipal Code have been met. Final acceptance is defined has having the 'final inspection' completed, having the 'punchlist' prepared during the 'final inspection' completed, and then having started the 18-month warranty period required by City ordinances. Other City departments will be involved in acceptance of the project including the Public Works Department and the Community Development Department.

1.14 ENGLISH VERSUS METRIC UNITS

The City requires the use of English units for all projects within the City. All designs, drawings, studies, etc. are to be completed in English units.

1.15 CONSTRUCTION SPECIFICATIONS

Nothing contained in the *'Construction Specifications Manual'* or in any other part of this standard as implying the City will pay for any of these improvements. The landscape architect and/or professional engineer shall prepare their own construction specifications, which will be approved by the City Engineer, prior to receiving final approval and construction of the project.

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SECTION 2.0

DESIGN CRITERIA

2.1 INTRODUCTION

A. General - The City boundary includes the region generally east of the Oquirrh Mountains, south of 10200 South, west of the Jordan River, and north to 10200 South. Two entities provide parks, recreation and trails system in the City; the City of West Jordan and Salt Lake County. A map showing the City's boundary is contained in the standard drawings at the back of this document.

B. All contractors performing irrigation within the boundaries of the City of West Jordan are required to be a "Certified Irrigation Contractor".

2.2 EXCAVATION AND BACKFILL

A. Trenches - Trenches for irrigation pipe (plastic and brass) 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.

B. Backfill Composition - Fill dirt or sand shall be used as filling 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 no more than one-inch in diameter. Pipe depth for all plastic pipe shall be 18-24 inches on main lines and 12-18 inches on lateral lines with the appropriate fill as specified above. Returned to 90% compaction.

C. Excavation Under Hard Surfacing - Any excavation in or under the roadway, curb, gutter and/or sidewalk shall conform to the "City of West Jordan Public Improvement Standards, Specifications, and Plans". This is obtainable from the Engineering Division or the Development Services Department.

2.3 PIPE AND TUBE

A. General Requirements - 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 the road to the water meter box, must be culinary blue poly pipe with insta-tights. 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.

B. Plastic Pipe and Tubing - Plastic pipe shall be extruded from PVC 1120-1220 compound and should be labeled. All PVC pipe shall be Schedule 40. (6" or greater use CL 200) with Parks approval.

C. 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 80 PVC for the main line and schedule 40 PVC for the lateral lines; no gasket ductile push on fittings (no Harco fittings). 4" pipe and bigger must be installed with mj fittings with mega lugs.

D. Priming of PVC Slip Joints - All PVC slip joints shall be primed prior to being glued. Primer being Weldon P-70 or approved equivalent. 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.

E. Flushing and Testing - After the irrigation pipes, and the division work has been complete, but before the bubblers, drip line 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 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 90 p.s.i.
   1. The point of connection must be flushed and tested for leaks prior to back filling.
   2. The mainline must be flushed prior to the installation of station/control valves.
   3. The lateral lines must be flushed prior to the installation of sprinkler heads, drip lines, etc.

F. Wiring - All wiring pull box details shall be in accordance with the following:
   1. National Electric Code.
   2. Utah State Uniform Building Code.
   3. Recommendations by the Parks Division and/or the Division of Building and Safety.
   4. All wiring to be continuous.
   5. If splices are necessary, they are to be installed in a standard size valve box with a "3M DBR or DBY" dry splice or approved equivalent with 6' extra coiled in a box.
   6. All irrigation wiring under asphalt, concrete or any other hard surface needs to be in its own conduit.
   7. Three foot (3-ft) expansion loop at all corners.
   8. It shall be the Landscape Architect or Contractor's responsibility to call out any conflict between the above listed codes.

2.4 BUBBLERS, DRIP LINE, HEADS, BALL VALVES AND QUICK COUPLERS

A. General – All irrigation products must be either Rain Bird brand or Hunter brand products--no Toro brand irrigation products. All valves must have a Schedule 80 PVC threaded union on both sides of the valve. All automatic irrigation valves will have one (1) shut-off/isolation Brass ball 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.

B. 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 from one half to one inch away from the curb or walkway. All nozzles shall be tightened and adjusted for the proper radius, arc, and flow rate (gpm).
Special Note: Extreme care shall be taken in the layout and installation of heads.

C. Main Line Gate Valves (Isolation Valves) - All gate valves shall be resilient-wedge having a square key with a non rising stem and be rated for 200lb water, oil, gas. (i.e., Milwaukee series 105 gate valve or approved equivalent). All gate valves shall be installed with valve boxes. Six (6) inch or twelve (12) inch extensions shall be added, when necessary, to bring the valve boxes level with finish grade.

D. Quick Coupling Valves - A quick coupling valve shall be installed on all main lines immediately after the backflow prevention device. Quick couplers do not have to be installed at every valve box. All quick coupler valves shall be Rain Bird #44RC and installed in a ten-inch round valve box.

E. Quick Coupling Valve Keys - All quick coupling valve keys shall be Rain Bird 44K and shall have a hose swivel attached to the key. One valve key shall be turned over to the Parks Division at completion of the project.

F. Sprinkler Risers - No prefabricated swing joints. Swing joints need to be made with street ells and schedule 80 riser nipples to the appropriate size. Spray pop-up sprinkler heads shall have a double swing joint riser, constructed of funny pipe, barbed fittings and marlex street ells on the head side (see standard details).

2.5 IRRIGATION CONTROLLER

A. General –All controllers shall be mounted on a stable wall, power rack, or a formed concrete-based pedestal mount. All controllers shall be mounted in vandal proof and weather proof boxes. All control wires do not need to be taped to the main line, but buried to one side of the main line trench. Master valve wires need to be designated as a blue wire. Flow wire needs to be a Green 14 gauge solid core irrigation wire. Controller type, enclosure and location shall be approved by the Parks Division prior to installation.

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 conduit and buried at least 24 inches deep.

All control wire shall be 14 gauge solid core minimum. It shall run in the main line trench. Where it is not possible to run the controller wire in the main line trench, the wires are to be buried 24 inches deep in a conduit. There is to be a spare wire and a tracer wire run to every valve and along the main line. The wire must be coiled at least 14 times at each valve. Controller wire colors are as follows:

Common	White
Valve Wire	Red
Spare	Orange
Tracer	Yellow
Master Valve	Blue
Flow Sensor	Green

All local, State and National Codes shall take precedence in the furnishing and connecting a 110-volt electrical service to the controller.

B. Automatic Irrigation Controller - All irrigation systems shall include an electric automatic controller with multiple programs and multiple repeat cycle capabilities and a flexible calendar program. All controllers shall be equipped with an automatic rain shut-off device, and with features that will allow the Owner to adjust run times based on fluctuations in local climatic conditions. The automatic irrigation controller must interface with the city's Calsense central irrigation system. All irrigation controllers must be grounded according to the Utah State electrical code and must not exceed 10 ohms of resistance. The Parks Division will not program any controller for any landscape that is not the responsibility of the Parks Division for maintenance.

2.6 ELECTRIC REMOTE-CONTROL VALVES

A. General - There shall be no more than two valves 1" or smaller with isolation brass ball valves in a standard valve box, 1 1/2" or bigger station control valves including isolation brass ball valves need to be installed one per jumbo valve box. Valves shall be installed as specified on drawings and approved by the Parks Division. Remote-control valves shall be installed in 17" x 11.75" valve box (i.e., Carson Brooks Standard or approved equivalent, Note: this is the minimum size). There shall be no more than two valves per box and the valves must be positioned so the tops of the valves 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-schedule 80 union on each side of valves. All valves will have one (1) shut-off isolation brass 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.

2.7 CONNECTION AND CROSS-CONNECTION CONTROL

A. Connection Fee - The Contractor/Developer shall pay the appropriate water connection fee for the water meter, prior to any construction.
B. 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.

C. General Requirements - To comply 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's Backflow Prevention Specialist requires the installation of an approved

R.P.Z. (Wilkins 975xl).. 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 Water Superintendent. Maintenance and testing of the device shall be made by the Parks Division and the Water Division. The contractor shall be responsible for repairs and the cost of the repairs during the two-year warranty period.

D. Backflow Requirements, Inspections and Tests - Back flow prevention devices shall be selected from a list of approved devices set forth by the Utah Division of Public Water Supplies. A reduced Pressure Assemblies (RP) shall be the only accepted style of backflow prevention device (Wilkins 975xl). This selection shall then be approved by the City Water Division and the City Parks Division prior to installation.

Each device shall be installed in compliance with Utah State Plumbing codes and Utah Division of Public Water Supplies regulations.

Each device shall be tested within ten (10) days of installation and at least once yearly thereafter by a backflow technician licensed by the State of Utah. The location of each device shall be reported to the City Water Division and City Parks Division in writing within ten (10) days of installation.

E. R.P.Z. Location - Location of the installation of the R.P.Z. device must be approved by West Jordan City Parks Department prior to installation.

F. R.P.Z. Assemblies Devices (RP) – See standard details.

G. R.P.Z. assemblies must be protected from freezing and vandalism. R.P.Z. must be installed in a stainless steel/strong box. *See detailed drawing.*
   1. The bottom of the RP assembly shall be a minimum of 12 inches above the ground.
   2. 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.
   3. R.P.Z. shall not be installed in a pit.
   4. The relief valve on the RP shall not be directly connected to any waste disposal line, such as sanitary sewer, storm drains, or vents.
   5. The RP shall be maintained as an assembly.
   6. The RP shall be installed in a horizontal position only.

H. All outlets on potentially contaminated systems shall be posted:
"DANGER - UNSAFE WATER

Proper "Purple colored" pipe for unsafe water is commonly used.

Coverage Test: - Proper irrigation of the landscape should be performed prior to placement of sod, seeding or hydro seeding to bring up moisture content.

I. Irrigation Audit – Applies to all landscapes measuring over 1,000 square feet. Following construction and prior to issuing the city ownership of the property, an irrigation audit shall be conducted by an Irrigation Association Certified Landscape Irrigation Auditor (CLIA) who is approved by the City. The auditor shall be independent from the contractor, design firm, and owner/developer of the project. The irrigation audit will verify that the irrigation system complies with the minimum standards required by this ordinance. The average distribution uniformity for all tested turf zones (valves) must be at least 60% for fixed/sprays zones and 70% for rotors/stream zones. All turf zones (valves) shall be tested for distribution uniformity, up to a maximum of eight (8) zones. When the irrigation system consists of more that eight (8) zones, the auditor shall select and test eight (8) turf zones, including both fixed and rotor zones, which are most representative of the system. All other zones, including drip irrigation, microspray, bubblers, or other designs, shall be turned on and inspected visually for head placement, head adjustment, appropriate gallon-per-minute emitters, pressure problems, leaks and general coverage.

When the above audit is required, the auditor shall furnish a report to the City and owner/developer certifying compliance with the minimum requirements. Compliance with this provision is required before the City will issue the certificate of occupancy.

2.8 IRRIGATION DESIGN STANDARDS FOR IRRIGATION SYSTEMS REQUIRED BY SECTION 89-6-703(a)(2)

A. Irrigation Design Standards - Irrigation design standards shall be as outlined in the latest version of the "Minimum Standards for Efficient Landscape Irrigation System Design and Installation" prepared by the Utah Irrigation Association.

B. Pressure Regulation - A pressure regulating valve shall be installed and maintained by the owner if the static service pressure exceeds 80 pounds per square inch (psi). The pressure-regulating valve shall be located between the meter and the first point of water use, or first point of division in the pipe, and shall be set at the manufacturer's recommended pressure for the sprinklers.

C. Landscape Water Meter - A water meter shall be installed for landscape an irrigation system which is separate from the water meter installed for indoor uses. The size of the meter shall be determined based on irrigation demand.

D. On slopes exceeding 30-percent, the irrigation system shall consist of drip emitters, bubblers or sprinklers with a maximum precipitation rate of 0.85 inches per hour and adjusted sprinkler cycle times to eliminate runoff.

E. Each valve shall irrigate a landscape with similar site, slope and soil conditions and plant materials with similar watering needs. Turf and non-turf areas shall be irrigated on separate valves. Drip emitters and sprinklers shall be placed on separate valves.

F. Drip emitters or a bubbler shall be provided for each tree that is not located in a turf area. Bubblers shall not exceed 1.5 gallons per minute per device. Bubblers for trees shall be placed on

a separate valve unless specifically exempted by the City due to the limited number of trees on the project site.

G. Sprinklers shall have matched precipitation rates with each control valve circuit.

H. Check valves shall be required where elevation differences will cause low-head drainage. Pressure compensating valves and sprinklers shall be required where a significant variation in water pressure will occur within the irrigation system due to elevation differences.

I. Dip irrigation tubing shall be installed under mulch (bark or rock). All drip irrigation that is installed needs to be Rain Bird Xerigation. Filters and end flush valves shall be provided as necessary.

J. Valves with spray or stream sprinklers shall be scheduled to operate between 6 p.m. and 10 a.m. to reduce water loss from wind and evaporation.

K. Program valves for multiple repeat cycles where necessary to reduce runoff, particularly on slopes and soils with slow infiltration rates.

2.9 TAP SIZE AND METER SIZE

A. Parks: 2-inch tap with a 2-inch meter minimum requirement.
B. Parkstrip: 1-inch tap with a 1-inch meter minimum requirement.
C. Treescape: 1-inch tap with a 1-inch minimum requirement.

2.10 MOW STRIP

A. A 6x6 concrete mow strip is required to be installed to separate any grass areas from any planter beds areas.
B. A 6x6 concrete mow strip is required to be installed to separate different sizes of rock mulch.

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SECTION 3.0

MATERIALS

3.1 GENERAL REQUIREMENTS

This section discusses the materials involved in parks irrigation water pipeline distribution systems and associated construction activities. The materials selected have been chosen for their strength, durability and ease of maintenance. All materials, unless specifically approved otherwise, shall be new and unused.

Where applicable, American Water Works Association (AWWA) or other standards have been referenced and it shall be the responsibility of the developer/engineer/contractor to be familiar with those standards to insure compliance. Titles corresponding to the specific numbers are given in the reference section of the standards.

In some instances, particular manufacturers and product names have been mentioned as being approved. Other products may also meet the requirements, but must be first be approved by a Products/Materials Committee consisting of Engineering and Public Works staff and any other affected departments. The Committee will meet and make a recommendation to the City Engineer who will issue a decision in writing. One factor, which may be considered by the Engineering Department in any consideration of other products, is the need for some degree of standardization.

If at any time the Engineering Department believes that the use of a specific product must either be halted or changed, the City Engineer has the authority to make the change providing the decision is based upon an engineering, performance or maintenance evaluation.

3.2 TESTING AND FINAL ACCEPTABILITY OF MATERIAL

The Engineering Department will require such tests and certifications as deemed necessary to show that the specified materials have been employed. Notwithstanding prior factory or yard inspections, the City Engineer will have the right to reject any damaged or defective materials found on the job, which will affect the durability or performance of the installation and order its removal from the site.

3.3 MAIN LINE PIPE MATERIALS

General accepted main line pipe materials consist of either polyvinyl chloride (PVC) or ductile iron pipe (DIP) as described in this section. All materials which may contact drinking water shall be ANSI – certified as meeting the requirements *of 'NSF Standard 61, Drinking Water System Components'*. All pertinent water system components should be appropriately stamped with the NSF logo for field verification. The following pipe materials and sizes apply to work within the City of West Jordan water service area:

Pipe Diameter (inches)	Pipeline Type
8, 10, 12	PVC or Ductile Iron
16,18,20,24	Ductile Iron
24 and above	Ductile Iron

A. PVC Pipe – All materials which may contact drinking water, including plastic pipes, gaskets, lubricants and O-rings shall be ANSI – certified as meeting the requirements of *'NSF Standard 61, Drinking Water System Components'*. All pertinent water system components should be appropriately stamped with the NSF logo for field verification. Please refer to the City's *'Construction Specifications Manual'* for detailed information regarding this pipe type.

B. Ductile Iron Pipe. – The City allows the use of this pipe type for main lines which meet the following requirements:
   1. Pipe. The pipe shall conform to AWWA C151 for both quality and strength. Each pipe shall include the letters "DI" or word "DUCTILE" to indicate the pipe material.
   2. Joints. These shall be of the rubber gasket push-on joint type conforming to the requirements of AWWA C111 and being of the "tyton" type.
   3. Fittings. All fittings shall conform to AWWA C110.
   4. Lining and Coating. Unless otherwise approved, the internal surfaces shall be lined with a uniform thickness of cement mortar and then sealed with a bituminous coating in accordance with AWWA C104.

      Outside protective coatings are dependant upon the soil type in which the pipe will be buried. The engineer is to evaluate this issue and provide a recommendation along with backup information to the City Engineer for review and approval.

   Construction of this pipeline type may require full-time inspection from off loading of the material to completion of testing.

3.4 MAIN LINE FITTINGS

A. Ductile Iron Fittings. These fittings shall meet the requirements of AWWA C110. All fittings shall be rated for 250 psi. This standard covers but is not limited to fittings with combinations of ends including mechanical joints, plain end, flange, push joint. The fitting types are as follows:

   90, 45, 22-1/2, and 11-1/4 degree° bends

   Tees and crosses, reducers, caps and plugs, connecting pieces (MJ sleeve and MJ adapters), flanged bends, flanged tees and crosses, flanged reducers.

   Ductile-iron compact fittings, per AWWA C153, are allowed.

   It should be understood that care must be exercised to not mix mechanical and flange joint ends since they will not mate. Bolt ends shall be coated with Poly FM grease and each fitting wrapped in 10-mil Polyethyleen sheeting after installation.

B. Flanges, Bolts and Gaskets. They shall be flat-faced and meet the requirements of AWWA C207 and should be AWWA standard steel hub flanges, Class E (275 psi) (these flanges meet ANSI B-16.5). The flanges shall be marked with the size, name or trademark of manufacturer and with the AWWA class, i.e. "E".

Bolts and nuts are to be provided as indicated in the City's *'Construction Specifications Manual'*. Gaskets shall be of the drop-in gasket type, 1/8-inch thick.

Table 3.4.1.

Pipe Size (inch)	**Bolt Hole Dia.** (inch)	**Bolt Dia. and Length** (inch)	**No. Of Bolts**
8	7/8	¾ x 3-1/2	8
10	1	7/8 x 4	12
12	1	7/8 x 4	12
14	1-1/8	1 x 4-1/2	12
16	1-1/8	1 x 4-1/2	16
18	1-1/4	1-1/8 x 5	16

The inherent problem with flanges is that they are rigid and do not provide flexibility. Two keys to their installation are (1) uniform tightening of the bolts, and (2) prevention of bending or torsional strains. Proper anchorage is important to meet the latter objective.

C. Mechanical Joint Fittings. This is a bolted joint of the stuffing box type. Each joint has a bell provided with an exterior flange having bolt holes or slots, and a socket with gaskets to receive the plain end of the pipe or fitting. The joint also has a sealing gasket, follower gland with boltholes and tee head bolts with hexagonal nuts.

The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts.

Table 3.4.2.

Pipe Size (inch)	**No. Bolts**	**Bolt Diameter & Length** (inch)
8	6	¾ x 4
10	8	¾ x 4
12	8	¾ x 4
14	10	¾ x 4-1/2
16	12	¾ x 4-1/2
18	12	¾ x 4-1/2

D. Flexible Couplings. These are designed to connect plain end pipes with a mechanical compression joint to provide a stress relieving, flexible, leak proof joint. They can be ordered in steel or cast iron pipe sizes (note: C900 PVC pipe has same O.D. as cast iron).

E. Transition Couplings. These are used to connect pipes of the same nominal size but different materials. Steel and PVC pipes can be connected to one another.

F. Flanged Coupling Adapters. These are used to connect plain end pipe to flanged valves, pumps, meters, etc. They eliminate the need for both a flanged spool and coupling. Generally, they are available in sizes through 12-inches.

G. Insulating Couplings. These are used to stop the flow of electric current across the joint by means of an insulating boot.

H. Special Steel Pipe Fittings. AWWA C208 covers special fittings such as elbows, tees, crosses, reducers, etc., and should be consulted for a specific application.

3.5 SERVICE LINE MATERIALS AND FITTINGS

See "Part V – Water Policies & Design Criterial Manual", Section 3.5 for this information.

3.6 METER BOXES AND VALVES

See "Part V – Water Policies & Design Criterial Manual", Section 3.5 for this information

3.7 WATER METERS

See "Part V – Water Policies & Design Criterial Manual", Section 3.5 for this information.

3.8 MAIN LINE VALVES

A. Butterfly Valves
   1. General. Butterfly valves shall be tightly closing, rubber-seated valves conforming to AWWA C504. Valves must be Class 150-B designed for tight shut-off up to 150 psi. Valve disc shall rotate 90 degrees from fully open to tightly closed position.
   2. Valve body. Shall be cast iron with intregally cast mechanical joints, ends for the pipe or flanged ends.
   3. Valve operators. Shall be of the manual traveling-nut type. Operators shall be equipped with a 2-inch AWWA square operating nut. They shall be sealed and gasketed and lubricated for underground service. The operator shall be capable of withstanding an input torque of 450-foot-pounds (ft.-lbs.) at extreme operator position without damage.
   4. Painting. See Section 3.16.
   5. Marking. The manufacturer shall show on the valve the valve size, manufacturer, class and year of manufacture.
   6. Approved valves. Shall be AWWA approved M & H 450, tested up to 250 psi.

B. Resilient-Seated Gate Valves. This specification pertains to resilient-seated gate valves for underground service 3-inches to 12-inches in size where design-working pressures are less than 200 psi. Resilient-seated gate valves shall meet the requirements of AWWA C509 specifications and shall generally be of the same size as the main in which they are installed. All such valves shall be of the non-rising stem type, with O-ring seal, equipped with 2-inch square operating nut, which shall turn to the left in a counter-clockwise direction to open the valve. Valve bodies and

gates are to be epoxy coated and shall be manufactured of ductile iron with internal working parts machined from the grades of bronze specified as follows:

Part	Grade of Bronze AWWA C509, Table I
Stem	E
Stem Nut	A

Currently approved valves are manufactured by the Clow Corporation and the Mueller Company.

See Section 3.16 for painting and coating requirements.

C. Plug Valves. Special approval required.
   1. General. This is a special type of valve which must be reviewed by the Engineering Department prior to receiving approval for its installation. The Engineering Department will consult with the Public Works Department on issues related to this type of valve. Plug valves are to be used where the water main pressures are expected to exceed 150 psi or where required by the Engineering Department. They shall be pressure lubricated, venturi pattern type with flanged ends and are to be epoxy coated.
   2. Valve operators. When located below ground, they shall be spur gear operated with watertight gear housings, lubricant pipe and road box; then located above ground or in vaults, they shall be worm gear operated. Outside locations shall include watertight gear housings.
   3. Painting. See Section 3.16.

D. Tapping Saddles (Service Saddles) and Valves. Special approval only. Must be reviewed by the City Engineer prior to approval. The Engineering Department will consult with the Public Works Department on issues related to this type of material. Contractors are not allowed to hot-tap the City's water lines. The City Engineer will consider how many people will be affected, outage problems, night time shut-downs, etc. in his/her consideration of this approval.
   1. Tapping saddles. Tapping saddles shall be of material specifically designed to withstand the strains and vibrations of the tapping machine. Saddles smaller than 2-inches shall be double strapped brass. Saddles of 2-inches or larger are to be stainless steel. The tapping sleeve must have gaskets at each end of the sleeve. Sleeves with only an O-ring around the tapped hole are not approved. The City reserves the right to have hot-taps performed, or cut in tee, where line size is the same size as the hot-tap.

      Approved tapping sleeves are as follows:

Sleeve	Use
Smith Blair 665	Stainless steel flange 6-inch to 12-inch

Note: Larger sizes require special approval.

Six-inch hot-taps are only allowed on existing mains and only at the City's discretion.

2. Tapping valve. These shall meet all of the requirements under "gate valves" in the preceding section with the exception of items such as oversized seat rings to allow entry of the tapping machine cutter.
3. See Section 3.16 for painting and coating requirements.

F. Valve Box and Cover. The valve stack shall be cast iron, 8-inches in diameter (See Standard Drawing No. CW-155.

The valve box cap shall be of the heavy duty, long body type.
Approved is:

1. D&L Supply M-8040. Sixteen (16)-inch top, 36-inch base, waer lid (gate valves).
2. D&L Supply M-8042. Twenty-six (26)-inch top, 36-inch base, water lid (butterfly valves).

Developer/Contractor bury depths may require an extension, depending upon the depth of the valve: These shall be:

1. D&L Supply M-8062. (24-inch)
2. D&L Supply M-8064. (36-inch)

The valve box caps shall be painted the same as the hydrant materials.

3.9 COMBINATION AIR RELEASE ASSEMBLIES (Standard Drawing No. CW-180)

A. Mechanical Assembly. As discussed in Section 2.9, the combination air release assembly has both the features of an air release valve and an air and vacuum valve. Both units shall be housed in a cast iron body and all internal parts such as the float, bushings, level pins, seat and baffle shall be either stainless steel or brass as furnished by the manufacturer. All assemblies shall be rated at 300 psi maximum operating pressure. Approved assemblies are as follows:

Size (inch)	**GA Industries Valve No.**	**Height** (inch)	
1	945	10	FIPS x FIPS
2	945	12	FIPS x FIPS
3	945	15	FIPS x FIPS
4	945	17	FIPS x FIPS

*Used only where working pressure under 125 psi for one-inch and 165 psi for large sizes.

The inlet threads shall be iron pipe threads of the same size as the valve.

B. Metal Housing or "Can". Shall be per Standard Drawing No. CW-180.

C. Service Lines. Type K soft copper per Section 3.5. There shall be a corporation stop at the main per Section 3.5.

D. Ball Valves. Watts FBV-3L, ¾-inch to 3-inch, with a female iron pipe thread on each end and tee head.

E. Guard Posts. See Section 3.17.

3.10 BLOW-OFF ASSEMBLIES (Standard Drawing Nos. CW-185, CW-190 and CW-195)

A. 2-inch Blow-Off. Reference Standard Drawing No. CW-195. Materials shall be as follows:
1. Service line - Type K copper Section 3.5 with a corp stop and saddle at main per Section 3.5.
2. 2-inch Ball valve - James Jones 1900 or Ford B11-777 with female iron pipe threads on each end and tee head.
3 Vault - The same as for a meter installation up to one-inch, see Section 3. 6.
4. Plastic plug - This shall protect top of ball valve.

B. 4-inch Blow-Off. Reference Standard Drawing No. CW-190. Materials shall be as follows:
1. Service line – 4-inch PVC per Section 3.8. There shall be a bottom outlet tee on the main per Section 3.4, which also discussed other miscellaneous fittings.
2. 4-inch valve – Gate valve per Section 3.8.
3. Flanged spool - Made of ductile iron per Sec. 3.4.
4. 4-inch brass nipple.
5. 4-inch Angle Meter Valve - Approved is Clow/Rich No. 125 all bronze wharf hydrant with 4-inch iron pipe thread inlet and one 4-inch outlet.
6. Vault - Concrete box with cast iron cover. Approved is Brooks 72 PB which is 17x 41-inch or Quikset 1444 which is 16x 44-inch. Both shall have cast iron covers.
7. Guard Posts - Required where an above ground blowoff is located in undeveloped areas.

3.11 FIRE HYDRANT ASSEMBLIES (Standard Drawing No. CW-165 and CW-170)

See "Part V – Water Policies & Design Criterial Manual", Section 3.5 for this information.

3.12 PIPE TRENCH MATERIALS

Refer to Standard Drawing No. CW-25 for trench cross section terminology.

A. Within Pipe Zone. The pipe zone extends from the bottom of the trench to 12-inches above the top of the pipe. The material within this zone shall be clean, well-graded imported sand with sizes within the following ranges:

Sieve Size	Percent Passing
No. 4	100
No. 8	80 – 95
No. 200	0 - 10

The material supplied within the pipe zone shall be compacted to a minimum 95-percent density.

B. Above Pipe Zone. The materials shall conform to the requirements of the City's *'Construction Specifications Manual'*. In the absence of stricter requirements, the material above the pipe zone

shall be native material that does not contain rocks larger than 6-inches and shall be made so graded that at least 40 percent of the material passes the No. 4 sieve. The material supplied for the area above the pipe zone shall be compacted to a minimum 95 percent density.

B. Special Slurry Backfill. For pipelines, which are laid in an already paved street, the Engineering Department may require the backfill above the pipe zone to be one sack slurry mix in lieu of compacted soil backfill. The slurry mix shall have no less than one sack cement per cubic yard. Test results will be required to be given to the Engineering Inspector to verify the proper mix was provided.

3.13 ROADWAY MATERIALS

Pavement materials for resurfacing of trenches cut into existing pavement shall comply with the requirements of the City's *'Road and Bridge Design and Construction Standards'* adopted by the City Council and all subsequent amendments thereto (for information, Standard Drawing No. CW-50 contains portions of those requirements). Asphalt, aggregate base and aggregate sub-base specifications are those set by the latest published edition of City's *'Construction Specifications Manual'*.

3.14 CONCRETE MATERIAL

Approved concrete material shall be based on the 28-day compressive design strength and shall be chosen according to the City's *'Construction Specifications* Manual' and the following chart showing its intended use:

Class	**Application**	**28-Day Compressive Strength** (psi, min.)	**Maximum Aggregate Size,** (inch)	**Slump Min.**	**Inches Max.**
A	Walls, structures and reinforced encasements	4,000	1-1/2	3	6
B	Thrust blocks, non-reinforced pipe encasement, non-structural use	3,500	1-1/2	2	6
C	Pump-mix for abondoning lines	1,000	3/8	Adequate for pumping	Adequate for pumping

3.15 REINFORCING STEEL

A. Bar Reinforcement. Shall be Grade 40 minimum deformed bars conforming to ASTM A615, accurately placed securely in position. Where bars are spliced they shall be lapped at least twenty diameters or butt welded, except where otherwise shown on the plans.

B. Mesh Reinforcement. Mesh reinforcement shall conform to the requirements of ASTM A185; wire gauge and mesh dimensions will be as shown on the plans.

3.16 PAINTING

A. General. Please refer to the City's *'Construction Specifications* Manual' for full information on this item. Paints shall be delivered to the job site in original, unopened cans or packages bearing the brand name and manufacturer's name. Paints specified shall be used unless specific written approval is obtained from the City Engineer in advance to use other products.

B. Epoxy Coating. All valves shall be epoxy coated as indicated in the City's *'Construction Specifications Manual'*.

C. Plastic Film Wrap. This wrap shall be used around all buried valves, bolted flanges and other fittings. The polyethylene film shall be of virgin polyethylene as produced from DuPont Alathon resin and shall meet the requirements of ASTM Designation D 1248 for Type 1, Class A, Grade E-1, and shall have a flow rate or nominal melt index of 0.4 g/min. maximum.

The polyethylene film shall be 8 mils in thickness. The length shall be sufficient to firmly attach the film to the pipe on either side of the valve, flange or fitting. The following minimum flat sheet widths shall be used for the specified valve sizes:

Nominal Valve or Flange Size (inch)	**Minimum Flat Sheet Width** (inch)
4	24
6	24
8	24
10	30
12	36
16	48
18	48

At the contractor's option, tubular material may be purchased and cut with one side to fold out to the required width.

Tape for securing the polyethylene wrap shall be 2-inches wide adhesive tape such as Polyken No. 900 (Polyethylene), Scotchrap No. 5 (Polyvinyl), or approved equal. The tape shall be such that the adhesive will bond securely to both metal surfaces and polyethylene film.

3.17 MARKER POSTS

In easements or where required on the plans, marker or guard posts shall be installed per the requirements of the Engineering Department. Where no vehicular traffic could be anticipated, the posts shall be 4x4-inch by 5-foot, 6-inch dense structural grade redwood surfaced on all four sides and chamfered on the top. They shall be set into the ground 30-inches.

Where vehicular traffic could disturb the post or where its primary function is as a guard post, the material shall be 4-inch diameter, standard weight galvanized steel pipe, 5-foot, 6-inch in length. Set the post 30-inches below ground in a concrete base of not less than 18-inches in diameter. Unless otherwise approved, marker posts shall be painted "school bus yellow" per Section 3.16.

Marker posts are to be considered in areas of open terrain to mark pipeline locations, and especially above ground features or vaults. These markers are to be placed no more than 100-feet apart in open terrain to mark underground piping. Please refer to the ballard and sign detail in the *'Standard Drawings Manual'*.

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SECTION 4.0

PLAN PREPARATION

4.1 GENERAL

Section 4.0 of the manual identifies landscape and irrigation plan preparation work which is to be coordinated through the Engineering, Public Works and Community Development departments. The Developer is responsible for obtaining the necessary City design and construction standards, permits, and for coordinating with the Engineering Department to ensure its requirements have been met. It is the Developer's responsibility to complete the work required. The Developer is responsible for expediting the work and obtaining the necessary approvals and permits necessary to proceed with construction.

In the case of construction of secondary water canal weirs, the Developer is responsible for processing these approvals through the respective canal company prior to preliminary plat approval. The Developer is to provide all fees and securities necessary to construct these facilities.

4.2 PLANNING COMMISSION APPROVED SITE PLAN, SUBDIVISION OR OTHER PROJECT

Once the Developer has received Planning Commission approval of the Site Plan, Subdivision, or other approved project, then the City will allow the processing of the *'Released for Construction Drawings'*, which contain the landscape and irrigation plans. These drawings are required to be consistent with the approvals of the Planning Commission for the project, or City staff will not accept the application for the processing of the *'Released for Construction Drawings'*. If the Developer/engineer proceeds with design prior to approval at by the Planning Commission, they do so at their own risk.

4.3 MASTER PLANS

One of the first items the Developer needs to do is to review the City's master plan for parks & trails prior to starting design of these types of projects. This master plan is the:

A. Parks, Recreation & Trails Master Plan

In conjunction with the parks maser plan, the Developer will also need to review the various infrastructure master plans which may be related which include:

1. Culinary water system
2. Secondary water system
3. Transportation
4. Storm drainage system
5. Wastewater system

The Developer needs to contact the Engineering Department and review these documents with them prior to proceeding with design.

4.4 DESIGN AND CONSTRUCTION STANDARDS

The Developer is responsible for obtaining the City's design and construction standards for parks and trails, land disturbance and related infrastructure. These standards are available through the Engineering Department for a fee, which covers the cost of reproduction of these documents. The fee is indicated in the City's Consolidated Fee Schedule and is available on the City's Website *www.wjordan.com*. Please see the Finance Department for the most current version of the City's Consolidated Fee Schedule.

4.5 PRELIMINARY DESIGN

All preliminary and final design is to be in compliance with the City's master plans and design and construction standards and is to include the following:

A. Master Plan Compliance – Prior to beginning design of any facilities, the Developer is to meet with the Engineering Department and receive information regarding facility sizing/locations for the proposed project. Call ahead and set up an appointment through the Engineering Department secretary.

B. Fire Flow Calculations – The Developer is to demonstrate to City Staff, through engineering calculations prepared by a registered civil engineer, that the fireflow required by the Fire Department can be met, prior to the construction of buildings being started. Prior to an outside consultant preparing these calculations, the Developer's consultant must obtain Engineering Department approval of the modeling technique and assumptions.

C. Flood Plain Evaluation – The Developer is to submit a flood plain evaluation performed and stamped by a registered civil engineer to document whether the property lies within a flood plain or not.

D. Drainage Calculation – The City has completed a storm drain and flood control master plan, which identifies major storm drain facilities to which each Developer must connect. The Developer is responsible for constructing pipelines and other facilities to the master plan facilities. Calculations must be prepared for the Developer provided facilities by a registered civil engineer and submitted to the Engineering Department for review and comment. The City will return an approved set of calculations to the Developer once these calculations are deemed to meet the City's requirements.

E. Traffic Impact Study – The Developer may be required to pay for a traffic impact study to be prepared by a registered traffic engineer, under the Engineering Department's direction that addresses the traffic and transportation impacts of the project. The extent of investigation and scope of work is defined in Appendix R – Guidelines for Traffic Impact Studies and will be determined by the Engineering Department. All original copies of the report are to be wet stamped and signed by the traffic engineer.

F. Geotechnical Report – The Developer is to submit to the Engineering Department for approval, a geotechnical report prepared by a registered geotechnical engineer if structures are involved in the parks & trails construction. This report is to contain a soils report of the project's underlying soils, which is to identify groundwater levels and other soils data important to construction of the

road and structures. The report is to contain recommendations to correct problems in the field and is to also contain a section that identifies pavement design for all facilities to be dedicated to the City. In Appendix S of the City's Development Processing Manual, a guideline for geotechnical reports identifies the extent and scope of work for the geotechnical report and the report is to be delivered to the Engineering Department directly from the geotechnical engineer preparing the report. All original copies of the report are to be wet stamped and signed by the engineer.

G. Grading Report – The City has established a Land Disturbance Ordinance as part of its Municipal Code and will require a grading report including drawings prepared for each project. The report will need to identify where dirt will be move from, where its final placement will be, how it will be placed and methods of placement and compaction to meet the City's land disturbance ordinance. Prior to performing any grading on the project, the Developer is to obtain a Land Disturbance Permit from the Engineering Department. All projects over 5 acres in size are also required to have Utah Pollution Discharge Elimination System (UPDES) and Storm Water Pollution Prevention (SWPP) permits from the State of Utah, Department of Environmental Quality.

4.6 FINAL DESIGN AND DRAWING PREPARATION

Final design is to take into account the City's design and construction standards for all publicly dedicated facilities. These standards are available through the City's Engineering Department for a fee or online at *www.wjordan.com*.

A packet is to be submitted to the City's Engineering Department that includes all design assumptions and calculations and certifies the City's standards have been followed. Final drawings are to be submitted on the City's standard size sheets of 24x 36. Final drawings will be signed and stamped by the Developer's registered professional engineer for the project.

Landscape and irrigation drawings submitted to the Engineering Department are to be organized according to the following order:

1. Cover Sheet
2. Abbreviations, Legends and Index Sheet
3. General Notes Sheet
4. Typical Sections Sheet
5. Survey Control Plan Sheet
6. Overall Site Plan Sheet
7. Overall Utility Plan Sheet
8. Site Demolition Plan Sheet
9. Layout Plan Sheet
10. Dimension Plan Sheet
11. Overall Grading and Master Storm Water Plan Sheet
12. Grading and Storm Drainage Details Sheet
13. Overall Storm Water Pollution Prevention Plan Sheet
14. Landscape Plan Sheet
15. Irrigation Plan Sheet
16. Site Details Sheet

17. Landscape Plant Schedule Sheet
18. Landscape Details Sheet
19. Irrigation Details Sheet
20. Quality and Schedule Sheet

Additional information is provided in the Engineering Department, Construction Drawings Checklist contained in Appendix M – Subdivision Final Plat Process of the City's Development Processing Manual. This completed and filled-out checklist is required to be submitted with the copies of the check prints submitted for City review.

The following items are required as part of the landscape and irrigation construction plans:

A. Copies - Five copies of construction plans are to be submitted:
   1. One set for Engineering Department review
   2. One set for Public Works Department review
   3. Two sets for Community Development Department review (one for CDD staff, one for outside water conservation review)
   4. One set for the City files

B. All drawings are to be clear and legible and conform to good engineering and drafting practice.

C. Drawings are to have signature blocks for Engineering, Community Development, Public Works, Fire Department and other City departments on all sheets. Departments will sign off on their block as they review it.

D. Size - 24x36 with ½-inch border on top, bottom, and right sides; left side is to be 1 ½-inch.

E. Plans are to include the following information:
   1. North arrow (plan)
   2. Elevations reference to USGS datum
   3. Stationing and elevations for profiles
   4. Title block located in lower right corner of sheet to include:
      a. Project title
      b. Specific type and location of work
      c. Name of engineer with license number and Utah Engineer's stamps
   5. Scale: 1"=20' or 1"=40' horizontally, 1"=2' or 4' vertically
   6. Both plan and profile views for curb and gutter plans for:
      a. Each side of the street
      b. Center line, may be eliminated
      c. Top of curb elevations with curve data must be shown for all curb returns
   7. Landscape plan
   8. Irrigation plan
   9. Culinary water system - Size and location of mains, laterals, mains, valves, hydrants and pipe type.
   10. Secondary water system - Size and location of mains, laterals, vales, fittings, etc.
   11. Sanitary Sewer system - Size and location of mains, laterals, mains, valves, hydrants and pipe type.

12. Storm Drain system - Size and location of mains, laterals, mains, valves, hydrants and pipe type.
13. Subdrains, their manholes and cleanouts.
14. Irrigation facilities
    a. Size and location of all required irrigation piping
    b. Data regarding flow and outfall of affected irrigation water
    c. Separate sheets of details for structures, etc.

4.7 GUIDELINES AND CRITERIA FOR PLAN PREPARATION

A. Plan Submittal - Submittal to the city generally falls into three categories:
   1. Initial submittal,
   2. Resubmission addressing City comments and
   3. The final submittal of the originals for City approval. The general requirements for each of these submittals are outlined in Table 1.1.

Table 1.1 – Submittal Requirements

Item	Required for initial Screening Acceptance	Required for Resubmmittal	Required for Approval
Number of Plan Sets (bluelines)	5	As Requested	Original Mylar Duplicate Mylar
Bond Estimate Form (completed by engineer)	1 Copy	As Requested	Approved Estimate
Tentative Map or other Conditions	1 Copy	-	On File
Final Map Conditions	-	1 Copy	On File
Geotechnical Soils Investigation Report (1)	2 Copies	-	On File
Traffic Impact Analysis (2)	2 Copies	Approved	On File
Drainage Study (2)	2 Copies	Approved	On File
Notarized Off-Site Grading Authorization Letter (3)	-	1 Copy	On File
Improvement Bonds	-	-	Posted
Plan Review and other Fees	-	-	Paid

(1) – if construction of public street is required
(2) – if required as a condition of approval
(3) – if offsite grading or construction is required
(4) – if design deviates from Guidelines or Standard Requirements
(5) – Required if Subdivision Agreement is to be used

The specific requirements of each of these categories are discussed in greater detail in the following subsections.

B. Plan Submittal - Engineers submitting plans to the City for initial screening are to provide:
   1. Five (5) sets of complete plans (check prints) sealed by a licensed landscape architect for the landscaping and irrigation plans, and by a registered Engineer in responsible charge for any civil work required for the project.

2. One (1) copy of the completed bond estimate form with quantities for all public improvements, also quantities should be shown on construction plans.

In addition, the following items are required as part of the initial review submittal:

1. Two (2) copies of the geotechnical soils investigation report if the project includes construction of public streets. The report must include a pavement section recommendation for all proposed public streets.
2. Verification of traffic impact analysis (TIA) submittal to the traffic engineer if a TIA is a condition of approval.
3. Verification of drainage study submittal to Engineering Department if a drainage study is a condition of approval.
4. When a project requires grading or construction off-site, One (1) copy of a notarized authorization from every private property owner on whose property work is required.
5. Written notice of deviations. If the plan submittal contains deviations from either these guidelines or the requirements of the uniform standards and City policy, the design engineer is to as part of the initial submittal include a letter to the City outlining all deviations and substantial reasons for requesting the deviations.

In addition to the items outlined above the Assessor's Parcel Number (APN#) is to be placed on the cover or title sheet of the submittal. Fire flow information is to be placed on the water plan if a structure is involved and secondary water information is to be placed on the master utility plan.

All initial submittals are reviewed for conformance to the Engineering Department initial plan screening checklist. Failure of the design architect/engineer to include the required information with the initial submittal will result in rejection of the plan submittal and the return to the design architect/engineer. If the submittal contains sufficient information to be processed for review, the submittal will be accepted and both the design architect/engineer and developer will be notified. Following the initial plan screening, the five plan sets submitted will be circulated to various sections within the City for review and comment. The initial review will take from 3 to 4 weeks with redline reviews taking a week to return. When comments are received from the other City reviewing groups, the Engineering Department will consider the comments and review the plans for conformance to City standards. The Engineering Department will transmit the review comments to the design architect/engineer and either request the plans be resubmitted for review or that mylars be submitted following corrections.

C. Resubmittal - If the conditions of approval or the Engineering Department require a drainage study or traffic impact analysis, those studies are to be approved prior to resubmittal of the improvement plans to the Engineering Department.

Engineers resubmitting plans to the City for review are to provide:

1. Five (5) sets of complete plans (check prints) as requested from the initial review sealed by the Architect/Engineer in responsible charge.
2. One (1) copy of the initial plan review comments (redlined plans).
3. Verification of Traffic Impact Study (TIS) approval by the Engineering Department if a TIS is a condition of approval.
4. Verification of drainage study approval by Engineering Department if a drainage study is a condition of approval.

5. Design engineer's certification that the grading plan is in conformance with the approved drainage study.
6. Design engineer's certification that the plans are in conformance with the approved traffic impact study, if required.

Plans resubmitted to the City for subsequent review are to address all previously made land development review comments. The design engineer is to certify the grading plan conformance to the approved drainage study with the initial resubmittal and subsequently thereafter. All redesign from the previous submittal is to be clearly identified. In the event of major changes or significant redesign from the previous submittal, the design architect/engineer should contact the Engineering Department to schedule a meeting to discuss the redesign concurrent with the resubmittal. Failure to meet with the Engineering Department to resubmitting a major redesign may delay the plan process.

Each resubmittal review process takes 7 working days. After reviewing the plans, the Engineering Department will either return the plans to the design architect/engineer to address comments or request that original and duplicate mylars be submitted to the City for approval.

D. Required Easements and Rights-of Way - When improvement plans indicate easements to be dedicated or rights-of-way granted a complete package must be submitted prior to approval of the plans. This package must include legal descriptions, 8 ½ by 11 sketch and current vesting document. Easements may include ingress/egress, drainage, sewer, and intersite easements.

E. Final Submittal and Plan Approval - Improvement plans for projects cannot be approved until after the final plat is approved. Prior to submitting original mylars and duplicate mylars to the Engineering Department for approval, certain prerequisite items must be submitted to and approved by the City. As part of the initial plan submittal the design architect/engineer is required to submit a complete bond estimate form. This form is reviewed and if it is deemed accurate with no major design issues outstanding, an approved bond estimate form will be provided to the design architect/engineer. The process of completing the bond estimate and obtaining the required bond estimate form is the responsibility of the developer and should be commenced early on in the process.

F. Request for Deviation Procedure - All deviations from these guidelines, the uniform standards or City policy are to be submitted to and approved by the Engineering Department. There are two types of deviations the engineer may need to address during the design process. First, deviations from the guideline requirements. All deviations from the guidelines are to be listed and submitted with the plans and other documents identified in "Initial plan submittal". Upon receipt, the deviation listing will be reviewed by the plan screener and supervisor. If the deviations are deemed to have merit, the plans will be screened and either accepted or rejected. If the deviations are considered to be only for the convenience of the design architect/engineer, the Engineering Department will review the deviation request. If the Engineering Department considers the deviations acceptable, the plans will be screened and either accepted or rejected. If the plans are rejected and the design architect/engineer desires to appeal the decision, the appeal is to be made in writing to the City. Upon receipt of the design architect/engineer appeal, the architect/engineer will schedule a meeting with the design architect/engineer and the City staff engineer. The purpose of the meeting is to allow the design architect/engineer the opportunity to present its case to support the request. Within five working days following the appeal meeting, the Engineering

Department is to inform the design architect/engineer of its decision. The decision of the Engineering Department is to be final at this time.

The second type of deviation is a deviation from the requirements of the uniform standards and/or drawings or City policy. The architect/design engineer is to identify and request a deviation from standards in writing and submit the request along with the other documents required in subsection 4.7.B., "Initial plan submittal". If the deviation is deemed to be in the best interest of the City and the project, the plans will be allowed to proceed through the plan review process. If the deviation as requested is determined to be unacceptable to the City, the Engineering Department is to schedule a meeting with the design architect/engineer to attempt to resolve the issue. If the deviation is rejected and the design architect/engineer desires to appeal the decision, the appeal is to be made in writing to the City Engineer. Upon receipt of the design architect/engineer appeal, the City Engineer will schedule a meeting with the design architect/engineer and the City staff engineer. The purpose of the meeting is to allow the design engineer the opportunity to present its case in support of the request. Within five working days following the appeal meeting, City staff engineer is to inform the design architect/engineer of his decision. The decision of the City Engineer is to be final. If the denial of a deviation from standards or City policy will significantly impact a project, the design architect/engineer is to contact the Engineering Department to review and resolve the design issue prior to making the initial submittal.

G. Plan Setup Requirements - The City's Engineering Department is required to be the custodian of all improvement plans in perpetuity once they are approved. As the City moves to archiving plans on electronic media it is important that some degree of uniformity is maintained. The objective of the following plan setup requirements is to provide uniformity and standardization of plan submittal while allowing the design engineer flexibility with respect to presentation. Standardization of information along with uniformity in setup and presentation allows the review process to occur in a more orderly and timely fashion.

H. Plan Sheet Size - All plans submitted to the City of City of West Jordan must be signed and sealed by a licensed landscape architect and civil engineer who are registered in the State of Utah. Plans are to be plotted or drafted onto Mylar reproducible sheets and having an overall size of 24-inches wide by 36-inches long with margins placed accordingly. One and one-half inches on the left side and ½-inch on all remaining sides with a line thickness of 0.075 inches.

I. Title Block - Each plan sheet is to contain a title block located adjacent to the right side margin. The design architect/engineer has the flexibility to determine the layout of the title block provided the following information is included somewhere in the title block. The title block is to include:
   1. Title of sheet
   2. Project name
   3. Developer's or owner's name, address, and phone number
   4. Landscape architect's name, address, and phone number
   5. Licensed landscape architect's name, license number, and seal and signature.
   6. Engineering consultants name, address, and phone number
   7. Professional engineer's name, P.E. number and seal and signature
   8. Revision block

J. Benchmark - All projects are to utilize and reference an existing recorded City benchmark datum within one-quarter mile of the project site. If an existing benchmark is not located within the one-

quarter mile limit, a temporary benchmark on the project site suitable for the project construction/inspection purposes is to be established and referenced to the City datum. Every plan sheet to be utilized for construction of improvements is to indicate the referenced benchmark.

K. Drawing Scales - Drawing scales are to be a minimum of one-inch = forty feet (40') horizontal for plan views, unless otherwise noted in these guidelines. Drawing scales are to be a minimum of one inch = 40-feet horizontal, one inch = 4-feet vertical for plan and profile when slopes are less than 5 percent and a minimum of one inch = 40-feet horizontal, one inch = 8-feet vertical for plan and profile when slopes are greater than 5 percent. Plan and profile sheets are to be arranged such that the plan view is in the top half and the profile view is in the bottom half of the sheet. Profiles are to have vertical lines at every 50-foot station and horizontal lines at every 4-foot elevation.

   All details are to be drawn to scale. The horizontal and vertical scale need not be the same. The purpose of requiring details be presented at scale is to allow the plan reviewer the ability to see spatial relationships of the various elements in the detail.

L. Plan Orientation - Generally, in lying out and developing the design, the design engineer is to consider the following hierarchy in establishing plan sheet orientation;
   1. North should be to the top or right of the sheet
   2. Stationing is to be left to right unless the sheet orientation with respect to North will not permit. The image is to only be drawn on the front side of the Mylar.

M. Text Size and Line Weights - The final criteria for acceptance will be that all information provided on the plans be clear, concise and legible when the 24-inch x 36-inch sheet drawing is reduced to an 11-inch x 17-inch format. The following text size and line weight references are recommended for clarity but are not required. All text, which includes but not limited to dimensional text, spot elevations text, notes and other text are recommended to be Leroy (L80) or romans. Shx font type with a text height of 0.08 inches and a pen thickness of 0.25mm. Profile elevations and stations are recommended to have a text height of 0.1 inches and a pen thickness of 0.50mm. Detail titles are recommended to have bold type font with a height of 0.20 inches. Street names are recommended to also have a bold type font with text height of 0.25 inches. All existing underground utilities are recommended to be shown dashed.

N. Line Type, Symbols and Abbreviations - The City requires the use of line types, symbols and abbreviations consistent with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements, City of West Jordan City* Legends and abbreviation listings used on the plans are to only include those terms that are not included in the standards.

O. Plan Set Organization - The City requires that all sheets in the plan set be sequentially numbered, beginning with the title or cover sheet, with information presented and arranged in the following order:

   1. Cover Sheet
   2. Abbreviations, Legends and Index Sheet
   3. General Notes Sheet
   4. Typical Sections Sheet

5. Survey Control Plan Sheet
6. Overall Site Plan Sheet
7. Overall Utility Plan Sheet
8. Site Demolition Plan Sheet
9. Layout Plan Sheet
10. Dimension Plan Sheet
11. Overall Grading and Master Storm Water Plan Sheet
12. Grading and Storm Drainage Details Sheet
13. Overall Storm Water Pollution Prevention Plan Sheet
14. Landscape Plan Sheet
15. Irrigation Plan Sheet
16. Site Details Sheet
17. Landscape Plant Schedule Sheet
18. Landscape Details Sheet
19. Irrigation Details Sheet
20. Quality and Schedule Sheet

Depending on the complexity and scope of the project, a complete plan set may contain plan sheets from any or all of the above referenced groups. The guidelines indicate the minimum information. Data that must be presented and should not deter the design architect/engineer from providing additional information as may be required. In the event the design engineer believes that the requirements of these guidelines are not applicable to a specific site or condition, the engineer is to request a deviation from the City. To facilitate the plan review and construction process, the City prefers that certain information be placed in a specific location on given sheets. The preferred location is identified in ***bold italics*** following the item description.

Example: North Arrow (upper right quadrant of sheet)

The above example indicates that the preferred location for the north arrow is in the upper right quadrant of the plan sheet. The City realizes that on rare occasions it may not be possible for the design engineer to comply with the City information placement preference. In those instances, the design engineer needs to identify all deviations from these guidelines in writing and submit the deviation listing to the City in accordance with, "Request for deviation procedure".

P. Cover Sheet Requirements - The design architect/engineer may elect to provide a separate title sheet as part of the entire plan set or utilize the first sheet of the plan set to present additional information such as the vicinity map or quantities and thereby eliminate the need for separate sheets for those items. The guidelines allow the design engineer flexibility in the placement of information provided that such information is presented in a clear and concise manner. Regardless of whether or not the design engineer elects to utilize a separate title sheet, the first sheet of the plan set is to contain at a minimum the following information:
1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is shown.
7. Sheet size of improvement plans is 24" x 36".

8. Mylar sepia or vellum drawing sheets, not paper sepia drawing sheets, has been used for all drawings (At final submittal).
9. All lettering in capital letters, 3/16-inch (0.120-inch) size minimum.
10. Accepted City layout of title block.
11. Initials and last name of designer, drafter and checker on the drawings.
12. Name of City is shown.
13. Shows name and address of owner and/or developer.
14. Must show the name, address, fax number, and telephone number of the landscape architectural/engineering firm(s) preparing the plans.
15. Assessor's Parcel Number is shown.
16. Must clearly show the name, and "Phase" or "Unit", of the project. For subdivisions the name is to agree with the final map. For multiple units, each final map is to have a separate set of improvement drawings.
17. Drawings must be numbered consecutively and show the total number of sheets.
18. Provide an area map showing the project and how it fits into the immediate area. The map is to include a north arrow and details about the project (1" = 500').
19. Provide a vicinity map showing the location of the project. Vicinity Map Requirements - Every plan set submitted is to contain a vicinity map. The design engineer may elect to place the vicinity map on a separate sheet immediately following the title sheet or place the vicinity map on the title sheet. If the design engineer elects to place the vicinity map on the title sheet, no separate vicinity map sheet is required provided the information required by this subsection is presented on the title sheet. The vicinity map is to relate the project to major landlines and prominent geographic features on an expanded scale. The following information is to be provided either on the title sheet or the vicinity map sheet:
    a. A map of the City of City of West Jordan area with the project highlighted
    b. A site map of the project and construction area (*upper right quadrant of sheet)*
    c. North arrow for City and site maps

    In addition, the vicinity map may include the following items when applicable:

    d. Highways, streets, roads and railroads
    e. Channels, washes and bridges
    f. Other pertinent geographic features

    The City's information placement preference is not applicable when the vicinity map and associated required information is placed on the title sheet.

20. Seal and signature of the design professional is shown.
21. Approval block - Engineering Department.
22. Approval block for design architect/engineer and statement/disclaimer is provided

Q. Abbreviations, Legends and Index Sheet Requirements – This drawing sheet is to include the necessary abbreviations, legends and sheet index necessary for the project and are to include the following:
1. Title block
2. Project title
3. North arrow
4. "Call Before You Dig" symbol and telephone number is shown (plan sheets).

5. Revisions block is shown.
6. Provide a sheet index for all sheets in the lower right corner. All sheets are to be numbered consecutively.
7. Abbreviations are provided.
8. Legend is shown.
9. Section identification system is provided.
10. Detail identification system is shown.

R. General Notes Sheet Requirements - Every plan set submitted is to contain a General Notes sheet that provides applicable City standard notes. The following information is to be presented on either the second or third sheet of the plan set depending on how the design engineer elected to present the information required for the title sheet and vicinity map. The General Notes sheet is to contain the following information where applicable:
1. Title block
2. City of City of West Jordan General Notes
3. City of City of West Jordan Clearing and Grubbing Notes
4. City of City of West Jordan Grading Notes
5. City of City of West Jordan Sewer Notes
6. City of City of West Jordan Traffic Notes
7. City of City of West Jordan Streetlight Notes
8. City of City of West Jordan Fire Department Notes
9. City of City of West Jordan Water Standards Notes
10. City of City of West Jordan Dewatering Notes
11. City of City of West Jordan Storm Drainage and Flood Control Notes
12. City of City of West Jordan U.P.D.E.S. Notes
13. City of City of West Jordan Erosion Control Notes
14. "Call Before You Dig" symbol & telephone # (plan sheets)

S. Typical Sections Sheet Requirements – This drawing is to list all of the typical sections contained in the City's *'Policies & Design Criteria Manuals'* to be used for the project but they are not to be drawn in. The project is to reference these drawings as being included in the project and become part of the *'Contract Documents'* for the project. Additional typical sections not already provided as part of the City's *'Policies & Design Criteria Manuals'* may be drawn here. This sheet may include the following:
1. Title block
2. "Call Before You Dig" symbol and telephone number is provided (plan sheets).

T. Survey Control Plan Sheet Requirements – The Survey Control Data Sheet is to include:
1. Title block
2. North arrow
3. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
4. Co-ordinates at each outside boundary corner are shown.
5. Basis of bearings is shown on the drawing.
6. Shows the bearing equation, 10,000/10,000 co-ordinate at section corner or at point of beginning is shown.
7. Shows survey monuments found with identifying marker plates.
8. Indicates the class of survey and references to appropriate Record of Survey plats.
9. Shows monument lines, bearings, and distances between monuments.

10. At least two section corner ties to boundary are provided.
11. Legal description of boundary is provided.
12. Benchmark acceptable to the County, with elevation is provided. The plan must show identification number, location, and elevation per NAVD 88.
13. USGS datum of elevations is shown on plans.
14. Signature and stamp of the registered land surveyor who prepared the survey.

U. Overall Site Plan Sheet Requirements – The Overall Site Plan sheet's purpose is to provide an overall layout of the site which will be referenced in the remainder of the plan set. It provides a visual summary of the area of work so that those reviewing the plan set understand the extent of the work area. The inclusion of this sheet is mandatory. Overall Site plans are to provide the following information:
1. Title block
2. Scale at 1"= 60' or 1"= 100'
3. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
4. Layout of Site drawings which shows:
5. Shows relationship of utilities to each other on plan view.
6. Indicates all utilities including culinary water, sanitary sewer, storm drain, natural gas, secondary water, power, telephone, cable and all other utilities.
7. Water meter locations are shown.
8. Overhead utilities must be buried. Show existing overhead utilities on this drawing and indicate how and where they will be buried.
9. All utility stub-outs are to be shown. They are to be constructed into each lot past the City's right-of-way at least 10-feet.
10. Utility easements are to be shown. The City's standard is a 20-foot easement for one utility, and a 25-foot easement for two utilities.
11. All streets are named and existing and future right-of-way width to centerline is shown.
12. Existing and proposed hydrants and streetlights are shown.
13. Must show existing improvements in, and adjacent to, the project. Must clearly distinguish "existing" and "to be constructed" improvements (Plan Sheets).
14. Water and sewer facilities located and dimensioned from the centerline of the road or property line, are shown. Drawings must show a mandatory 10-foot separation between culinary water and sewer facilities.
15. Driveways, if known, are shown – sidewalk ramps are located.
16. Street or other lighting.

V. Overall Utility Plan Sheet Requirements - Master utility plans are generally provided for one of two purposes, either for construction or to indicate the schematic relationships of the various utilities. If the intent of the master utility plan is for construction, the plan is to have a scale of not less than one-inch = 40-feet to conform to the requirements of "General plan sheet requirements" and provide the information required by this subsection.

If construction plans are included in the submittal for the various utilities at a scale of not less than one-inch = 40-feet and the intent of the master utility plan is to indicate the schematic relationship of the utilities, then the plan scale can be reduced to a scale of not less than one-inch = 100-feet. Schematic master utility plans need to conform to the requirements of this subsection.

Master utility plans to be utilized for construction are to provide the following information:

1. Title block
2. Scale at 1"= 60' or 1"= 100'
3. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
4. Complete the separate Street Plan and Profile Checklist (C100) and show this information on this plan.
5. Complete the separate Sanitary Sewer Plan and Profile Checklist (SS100) and show this information on this plan.
6. Complete the separate Storm Drain Plan and Profile Checklist (D100) and show this information on this plan.
7. Complete the separate Culinary Water Plan and Profile. Checklist (CW100) and show this information on this plan.
8. Complete the separate Secondary Water Plan and Profile Checklist (SW100) and show this information on this plan. This will include pressurized secondary water design (pipelines) and unpressurized secondary water design (ditches and canals).
9. Shows relationship of utilities to each other on plan view.
10. Indicates all utilities including culinary water, sanitary sewer, storm drain, natural gas, secondary water, power, telephone, cable and all other utilities.
11. Water meter locations are shown.
12. Overhead utilities must be buried. Show existing overhead utilities on this drawing and indicate how and where they will be buried.
13. All utility stub-outs are to be shown. They are to be constructed into each lot past the City's right-of-way at least 10-feet.
14. Utility easements are to be shown. The City's standard is a 20-foot easement for one utility, and a 25-foot easement for two utilities.
15. All streets are named and existing and future right-of-way width to centerline is shown.
16. Existing and proposed hydrants and streetlights are shown.
17. Must show existing improvements in, and adjacent to, the project. Must clearly distinguish "existing" and "to be constructed" improvements (Plan Sheets).
18. Water and sewer facilities located and dimensioned from the centerline of the road or property line, are shown. Drawings must show a mandatory 10-foot separation between culinary water and sewer facilities.
19. Driveways, if known, are shown – sidewalk ramps are located.
20. Street and other lighting systems.
21. Fire Department flow calculation information is indicated.
22. Fire Department approval block is shown.
23. Public Works Department approval block is shown.

If construction information and data is clearly and concisely presented on other sheets of the plan set and the intent of the master utility plan is to indicate the spatial relationships of the various utilities, the amount of information on this plan may be reduced.

W. Site Demolition Plan Sheet Requirements – In the event that site demolition is required, this plan will be required to be prepared. This drawing will show all demolition included as part of the project and the drawing is to include:
   1. Title block
   2. Project title
   3. North arrow
   4. Scale of drawing

5. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
6. Revisions block is shown.
7. Layout of site drawing indicating what items need to be demolished.
8. Sheet notes.
9. Legend indicating existing concrete paving, lawn, shrubs, and trees that needs to be removed. Must also show which trees to maintain and protect during construction showing protection fences required and temporary irrigation required during construction.
10. Existing plant key showing the type of plant, size, and other information to describe the plant to ensure it is not removed.
11. Structures and other facilities to be removed are shown.

X. Layout Plan Sheet Requirements - This drawing is to indicate all items regarding construction. This drawing will require the following:
1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is indicated.
7. Sheet notes indicating existing concrete to remain, new concrete walks to be installed, concrete pavers to be installed, stamped concrete to be installed, showing bulk mulch areas, crushed stone mulch areas, and other items regarding construction.

Y. Dimension Plan Sheet Requirements – This drawing is to show the overall dimensions for various portions of the project, and is to show relationships of existing, future, hardscape, plant material, sprinkler systems, and other items on the site.
1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are shown (plan sheets)
6. Revisions block is indicated.
7. Dimensions of all items existing, or to be provided as part of the project, and their relationship through dimensions, on the plan.

Z. Overall Grading and Master Storm Water Drainage Plan Sheet Requirements – This drawing is to provide a summary, or overall view, of the project's grading and master storm water drainage plan. Subsequent drawings also are required to provide additional detail, if required. These drawings are to include the following:
1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
6. Revisions block is indicated.
7. A note on the drawing from the design engineer verifying that the proposed improvements comply with the City's design and construction standards and master plan for storm drainage and flood control.

8. Location of FEMA 100-year flood plain and wetlands are shown.
9. Drainage calculations – These are to include the assumption of the 100-year storm event with 0.2 cubic foot per second/acre discharge in 24 hours and are to be stamped by a registered professional engineer. Engineer is to use TR55 or HEC1 and provide output from these calculations. (Separate report)
10. Orifice sizes, number of manholes, invert and rim elevations; required riprap, required double inlet/dissipator, etc. are indicated.
11. Detention areas and details are shown. This is to include spillways at a 3:1 maximum side slopes.
12. Permits – State stream alteration, county flood control, Corps of Engineer (COE), etc. permits have been obtained and evidence has been received by the City.
13. Cross-sections showing the elevational relationship, property line, and existing or "to be constructed" walls project's boundary with adjacent properties are provided.
14. Finished floor elevation of all buildings adjacent to this property and spot grades on adjacent properties to show elevational relationships.
15. Pad and finished floor elevations for all new structures are shown. (Site Plan only)
16. Street names are shown, show at the front of each lot.
17. Percentage of grade and direction of flow is indicated.
18. Proposed and existing drainage easements, with dimensions, elevations and typical sections as needed.
19. Size, slope, location, and description of existing and "to be constructed" storm drain facilities are shown.
20. All existing and "to be constructed" block walls are shown.
21. "Sight visibility easements", with dimensions, are shown.
22. Distance and bearing from project boundary to major intersection or major roadway is shown.
23. Sidewalk ramps with dimensions are indicated.
24. Engineer's note stating that the grading plan conforms to the approved drainage study is provided.
25. Elevations shown (top of curb, flowline and crownline) at limits of construction, P.C.'s, P.T.'s, and grade breaks.
26. Contours, at two-foot intervals, for undeveloped property are shown.
27. Dashed lines and labels showing existing improvements, with elevations noted, as needed, are provided to show the project's conformity with the existing conditions.
28. Shows existing or "to be dedicated" rights-of-way and easements.
29. Existing conditions - Must show "Existing Conditions" for the property being developed and within 100-feet of the project's boundary.
30. Existing contours are shown.
31. Slopes of 30-percent or greater are shown.
32. Proposed contours for parking lot and landscaping are shown.
33. Floodplain note/ evaluation were provided.
34. Road widths match Transportation Master Plan and/or Planning Commission requirements.
35. Road grades are minimum 0.5-percent and a maximum of 12-percent.
36. Sidewalks are provided as required.
37. Curb and gutter are provided as required.
38. Any waterways provided are 6-feet wide and only used with prior Engineering Department approval.
39. Erosion protection is provided for all cut and fill slopes.

40. Energy dissipaters are provided on the outfall of drain lines discharging into creeks and earthen channels capable of slowing velocities to 3-feet per second.
41. Storm drainage calculations were provided and reviewed.
42. Subdrain system – If project fronts canal property, the geotechnical report indicates groundwater within the footing zone, or the area is known for a high groundwater table.
43. Subdrain note was shown, if applicable.
44. Storm drains lines, catch basins, and clean out boxes are provided as needed.
45. Catch basins are provided at all sag points and every 500-foot. Doublewide catch basins, with two grates, are provided at sag points so the directional vanes can be installed in both directions.
46. Combination cleanout boxes provided at all changes in direction and every 500-feet.
47. An overland release for storm water is provided for all sag points such that no structures would be flooded if the underground drain system were blocked or the capacity exceeded.
48. Cul-de-sacs are graded to drain away from the bulb.
49. Drainage calculations were submitted and checked.
50. Storm drainpipe within paved area of City streets is reinforced concrete pipe (RCP), CL III and is a minimum 15-inch in diameter. Laterals may be sized to a 12-inch minimum size.
51. Smooth-wall corrugated HDPE pipe may be used in areas outside the City's right-of-way.
52. Subsurface drains are provided to an approved system or outfall where needed to lower groundwater level to 3-feet below all basement levels. (To be maintained by Homeowner's Association)
53. Existing irrigation ditches have been piped or abandoned as approved by the ditch master.
54. Existing irrigation tailwater ditches or sheet flow is properly conveyed through the property.
55. All storm drainage conveyance systems have an oil water separator system, in heavily traveled areas (i.e. Commercial subdivisions, car washes, gas stations, etc.), in place before it discharges into the city system.

AA. Grading and Storm Drainage Details Sheet Requirements – This sheet is to include all of the details necessary to construct the grading and storm drainage facilities for the project. This sheet is to include:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is indicated.
7. Keyed Slope Detail
8. Backdrain Plan Section
9. Cut-Fill Transition Detail
10. Rear Lot Drainage Swale (Permanent)
11. Typical Section (Front to Back Lot Benching
12. Standard Rear Lot Inlet Box – Plan View
13. Standard Rear Lot Inlet Box – Profile View

BB. Overall Storm Water Pollution Prevention Plan Sheet Requirements – This plan is to meet the requirements of the City's ordinances and standards and the first part of the drawings/plan are to show the overall plan for erosion control and revegetation. Additional drawings may also be necessary to provide additional detail.

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. A verification from the design engineer that the proposed improvements comply with the City's design and construction standards for land disturbance.
8. Any project over 1-acre requires a SWPP plan and permit be prepared (permit application available in the Engineering Department).
9. Project description - Type of project, area to be disturbed, number of units (residential/commercial) or square feet (single-parcel commercial/industrial sites).
10. Description of existing site conditions - Topography, vegetation, streams, lakes, canals, drainage features.
11. Description of bounding areas that may be affected by land-disturbing activities - Streams, canals, roads, residential and commercial areas.
12. Critical areas called out on plan such as steep slopes and environmentally sensitive areas.
13. Erosion and Sediment control plan showing BMP practices
14. Permanent stabilization - Methods used to permanently stabilize the site (e.g., sod, seed.).
15. Grading report - Identify where dirt will be moved from, final placement, placement methods and compaction. Prior to any grading on project, this report is to be submitted to the Engineering Department for review.
16. Grading Permit from the Engineering Department.
17. Erosion protection is provided for all cut and fill slopes.
18. Energy dissipaters are provided on the outfall of drain lines discharging into creeks and earthen channels capable of slowing velocities to 3-feet per second.

CC. Landscape Plan Sheet Requirements – This plan provides a summary view of the location of all plant material, existing and future, to be installed on the project. The plan also designates which plants are located where, in relation to the fixed features such as buildings, sidewalks, etc.

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. Layout of site drawing.
8. Plant materials/identification table - Table indicating all types of plant material to be planted as part of the project. The table shall include a list of trees, shrubs, groundcovers, ornamental grasses, perennials. Table is to include an acronym, Latin name, and familiar name.
9. Street tree schedule.

DD. Irrigation Plan Sheet Requirements – This plan indicates all irrigation equipment including irrigation piping, heads, quick couplers, control valves, irrigation system controllers, laterals, main lines, existing mainline and other equipment, etc.

1. Title block
2. Project title
3. North arrow

4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. Layout of site drawing showing all irrigation equipment.
8. Irrigation legend – indicates symbols and describes what those symbols are for.
9. Emitter Schedule
10. Monthly landscape water allowance (gallons).
11. Irrigation Notes – These notes are to include an irrigation schedule, irrigation equipment, pipe sizing chart, and other notes. The irrigation schedule is to include a symbol for each head; the type and manufacturer of the various spray nozzles, whether they are full, half, quarter, etc. heads, their gallon per minute capacity at a specified pressure. The irrigation equipment list is to include a symbol for each piece of equipment, the piece of equipment and if applicable, a reference notation for the detail where additional information can be found. The equipment shall include quick couplers, control valves (with appropriate design information), irrigation system controller, lateral line, main line, existing mainlines, existing irrigation sleeve from previous construction contracts, new irrigation sleeves, isolation valves, and irrigation point of connection.

EE. Site Details Sheet Requirements – The Site Details sheets are to include all details required for construction of the various facilities and systems identified in these plans. These are to include: concrete sidewalk section, concrete joints, tree grate edging, typical control sidewalk scoring, concrete edge pavers, crushed stone, Strip drain trench, drain trench connection, boulder detail, boulder placement on slope, dry creek bed, concrete pavers pattern options, concrete pavers squares, paving pattern against concrete, concrete edging, concrete retaining wall plan(s), concrete retaining wall, and all other typical sections necessary. These types of sheets shall also include the following information:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. Individual site details.

FF. Landscape Plant Schedule Sheet Requirements – The landscape plant schedule is to include a plant schedule, general landscape notes, and other appropriate information. Further details are as follows:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. Layout of site drawing.
8. Plant identification table - Table indicating all types of plant material to be planted as part of the project. The table shall include a list of trees, shrubs, groundcovers, ornamental grasses, perennials. Table is to include an acronym, Latin name, and familiar name.

9. General landscape notes - Please see the City's standard notes for full detail regarding this information.

GG. Landscape Details Sheet Requirements – This sheet is to include all necessary landscape details necessary for the project. This is to include evergreen tree planting, tree guying (evergreen), tree planting and staking, tree wrap, tree protection fence, shrub planting, tree planting, and other details as necessary. This sheet is also including a table of 'Landscape Summary Information' and SLC 2004 Water-Wise Plant Determination.
1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. Landscape details necessary for construction.
8. Sheet notes as needed.

HH. Irrigation Details Sheet Requirements – This sheet is to include various schematics, details, and general irrigation notes as necessary to construct the project. The schematics are to include point of connection, multiple valve, single valve, and emitter layout schematics. Details shall include a quick coupler, manual drain valve, isolation valve, automatic valve, automatic drip control valve, stop and waste valve, typical trench, typical sleeving, backflow preventer, sleeving requirements, pedestal mount satellite controller, grounding rod wiring, tree irrigation, pop-up spray head, valve box stacking, typical thrust block, and drip emitter detail. The General Irrigation Notes are to be those of the City of West Jordan. Other information on this sheet is to include:
1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. Layout of site drawing.

II. Quantity and Schedule Sheet Requirements - Every plan set submitted is to contain a quantity estimate. The City requires the quantity estimate to contain quantities of all public improvements in a format consistent with the City's bond estimate form. In addition, the City requires quantities of improvements constructed within public easements, whether or not they are publicly maintained. If the project contains both public and private improvements, the design engineer may elect to indicate both quantity estimates on the plans to facilitate the review of the public improvement bond estimate. The quantity estimate may be placed on a separate sheet or on the title sheet. The design engineer may elect to use schedules to clarify construction items, however; the use of schedules is not mandatory.

4.8 STANDARD NOTES

The following Standard Notes are for reference and use only as they apply to a certain project. However, all projects must contain the "General Notes", and any other applicable set of Notes as applicable. For instance, if there is a culinary water system involved with the project, the entire list of

culinary water notes must be used. The same applies to other facilities which may be a part of the overall landscaping and irrigation project.

A. General Notes

1. All construction and materials are to be in accordance with the most current edition of the "City of West Jordan Policies & Design Criteria Manuals"; and other applicable approved standards issued by the controlling agency; the International Building Code; the International Fire Code; and all local City codes and ordinances as applicable, except as noted on this sheet as "Deviations from Standards".
2. The existence and location of any overhead or underground utility lines, pipes, or structures shown on these drawings are obtained by a research of the available records. Existing utilities are located on the drawings only for the convenience of the Contractor. Existing utility lines or service laterals may not be shown on the drawings. The Contractor is to, at his own expense, locate all underground and overhead interference's, which may affect his operation during construction and is to take all necessary precautions to avoid damage to it. The Contractor is to use extreme caution when working near overhead utilities so as to safely protect all personnel and equipment, and is to be responsible for all cost and liability in connection therewith.
3. The Contractor shall take all precautionary measures necessary to protect existing utility lines, structures and street improvements, which are to remain in place, from damage. All such improvements or structures damaged by the Contractor's operations are to be repaired or replaced satisfactorily to the Engineering Department and/or owning utility company at the expense of the Contractor.
4. All construction is to be as shown on the "Released for Construction" drawings. Any revisions are to have the prior written approval of the Engineering Department through the Change Order process.
5. Type V cement is to be used in all off-site concrete work. Concrete is to be 4,000 P.S.I. minimum @ 28 days. Mix designs to be approved by the City, prior to the use on the project.
6. An Encroachment Permit is required for any work in the public Right-of-way. The Contractor is to secure all permits and inspections required for this construction.
7. Expansion joints are required at a maximum 300-feet spacing in extruded-type curb and gutter.
8. Asphalt cement (AC) pavement is to be ½-inch above lip of all gutters after compaction, except at sidewalk ramps and cross gutters.
9. Curb and gutter found to be unacceptable to the City is to be removed and replaced.
10. Sidewalk ramps are to be constructed in each quadrant of an intersection per City of West Jordan Standards. Exact location of ramps may be adjusted in the field by a City inspector after approval by the City Engineer.
11. Contractor is to provide all necessary horizontal and vertical transitions between new construction and existing surfaces to provide for proper drainage and for ingress and egress to new construction. The extent of transitions to be as shown on the drawings.
12. All grading work is to conform to the soils report as prepared by the Soils Engineer, reviewed by the Engineering Department, and as shown on these drawings.
13. Exact location of all saw cut lines may be adjusted or determined in the field by a City Engineer, if the location of these saw cut lines is not clearly shown on the drawings, or existing pavement condition requires relocation.

14. The Contractor is to take all precautions necessary to protect existing permanent surveying monuments. Any monument disturbed is to be replaced and adjusted per available records at the Salt Lake County Surveyor's Office.
15. Utility company meter boxes, manhole lids, valve covers, etc., are to be located out of driveways, driveway aprons, flow lines, and cross gutters, unless written approval is granted by the utility company and the City Engineer.
16. All retaining walls, new or existing, are only shown on civil drawings for the purpose of reviewing grading relationships; flood control and sight distance at intersections. New retaining walls require a separate permit and inspection by the Building Division.
17. Asphalt mix design must be submitted and approved by the Engineering Department, prior to the placement of asphalt within City right-of-way.
18. Contractor is to adjust all new and existing inlets, valve boxes, manhole rims, and sewer clean outs, etc. to finish grade as applicable whether or not they are shown on the drawings.

B. Traffic Notes

1. All construction signing, barricading, and traffic delineation is to conform to the "Manual on Uniform Traffic Control Devices (MUTCD)", latest edition.
2. The street sign Contractor is to obtain street names and block numbering from the Engineering Department prior to construction.
3. Before any work is started in the right-of-way, the Contractor is to install all advance warning signs for the construction zone in accordance with the approved Traffic Control Plan. The Contractor is to install temporary stop signs at all new street encroachments into existing City streets where warranted immediately after first grading work is accomplished, and is to maintain said signs until permanent signs are installed.
4. When a designated "Safe Route to School" is encroached upon by a construction work zone and the City Engineer identifies a need for students to be assisted in the safe crossing through that work zone, the Contractor is required to provide a qualified "crossing guard". The guard is to be present for the full duration of time those children are likely to be present.
5. If the improvements necessitate the obliteration, temporary obstruction, temporary removal or relocation of any existing traffic pavement marking, such pavement marking is to be restored or replaced with like materials to the satisfaction of the Engineering Department.
6. The Contractor is to be responsible for providing and installing all permanent signs shown on the drawings. Street name signs are to conform in their entirety to current City standards. All other signs are to be standard size unless otherwise specified on the drawings. All signposts are to be installed in accordance with the current City standards.
7. When a proposed street light standard is located within 5-feet of any proposed sign shown on the drawings to be mounted on a signpost, the sign is to be mounted on the street light standard and the signpost is to be eliminated.
8. All permanent traffic control devices called for herein are to be in place and in final position prior to allowing any public traffic onto the portions of the road(s) being improved hereunder, regardless of the status of completion of paving or other off-site improvements called for by these drawings.
9. Street signs and stop signs are to be installed per City standard specifications for placement of street name signs.
10. The Contractor is to provide barricades, signs, flashers, other equipment and flag persons necessary to insure the safety of workers and visitors.
11. Work in public streets as approved by City Encroachment Permits, once begun, is to be expedited to completion so as to provide minimum inconvenience to adjacent property

owners and to the traveling public. Road closures are not allowed without advance written approval by the Director of Engineering.

12. The Contractor is to be responsible for notifying for Utah Transit Authority (UTA) and the Jordan School District Transportation Services Department if the construction interrupts or relocates a bus stop or has an adverse effect on bus service on that street to arrange for temporary relocation of stop.
13. New traffic signals or traffic signal modifications shall be approved by the City Engineer, the Utah Department of Transportation (UDOT0, and/or Salt Lake County (SLCo.) depending on their jurisdiction. All construction materials shall be provided by the Contractor unless other prior arrangements have been made with the City.

C. Streetlight Notes

1. No deviation of street light, pull box, conduits, their locations, etc., are to be permitted without written approval of the City Engineer. Any deviation from the plan location will require a written Change Order from the City Engineer.
2. All existing street lighting is to remain operational during construction.
3. All empty conduits are to have pull strings installed prior to final inspection.
4. Any structure such as block walls, chain link fences, retaining walls, etc., are to leave a minimum clearance of 18-inches to the face of street light pole on all sides when streetlight is installed behind sidewalk, and is to at no time completely enclose the street lighting pole.
5. As-built drawings are to be supplied to the Engineering Department who will provide copies to the Public Works Department prior to any pre-final inspection. The "As-built" drawing needs to be stamped "as –built" and signed by the preparer.
6. Service points are to be coordinated with Rocky Mountain Power (RMP) and, wherever possible, be located near the center of the circuit. Service points are to be shown on the drawings.
7. It is to be assumed that in the absence of an existing, workable circuit to attach to; all installations are to require a new service for operation of the circuit. In this case contact Rocky Mountain Power.
8. Wherever there is an overhead utility that may conflict with the installation of street lighting circuits and/or poles, these conflicts must be resolved between the Developer and the utilities involved before streetlight bases are installed at no expense to the City of West Jordan and RMP.
9. The Contractor is to furnish complete service to transformers and control systems if required on drawings, and is deemed necessary by RMP.

D. Grading Notes

1. In the event that any unforeseen conditions not covered by these notes, are encountered during grading operations, the owner/engineer is to be immediately notified for direction. Changes to the "Released for Construction" drawings are to be approved through the Change Order process.
2. It is the responsibility of the Contractor to perform all necessary cuts and fills within the limits of this project and the related off-site work, so as to generate the desired subgrade, finish grades and slopes shown.
3. Contractor is to take full responsibility for all excavation. Adequate shoring is to be designed and provided by the Contractor to prevent undermining of any adjacent features or facilities and/or caving of the excavation.

4. The Contractor is warned that an earthwork balance was not necessarily the intent of this project. Any additional material required or leftover material following earthwork operations becomes the responsibility of the Contractor.
5. The grading Contractor is responsible to coordinate with the owner to provide for the requirements of the project Storm Water Pollution Prevention Plan (SWPPP) and associated permit(s).
6. Contractor is to grade to the lines and elevations shown on the "Released for Construction" drawings within the following horizontal and vertical tolerances and degrees of compaction, in the areas indicated:

		Horizontal	Vertical	Compaction
a.	Pavement area subgrade	0.1'+	+0.0' to –0.1'	See soils report
b.	Engineered fill	0.5'+	+0.1' to –0.1'	See soils report

   Compaction testing will be performed by the owner or his representative and the results provided to the City.
7. All cut and fill slopes are to be protected even after effective erosion control has been established.
8. The use of potable water without a special permit for building or construction purposes including consolidation of backfill or dust control is prohibited. The Contractor is to obtain all necessary permits for construction water.
9. The Contractor is to maintain the streets, sidewalks and all other public right-of-way in a clean, safe and usable condition. All spills of soil, rock or construction debris is to be immediately removed from the publicly owned property during construction and upon completion of the project. All adjacent property, private or public is to be maintained in a clean, safe and usable condition.
10. In the event that any temporary construction items are required that are not shown on these drawings, the Owner agrees to provide and install such item at his own expense and at the direction of the Engineering Department. Temporary construction includes ditches, berms, road signs, and barricades, etc.

E. Fire Department Notes
1. Authorized hydrants for this project are:
   a. Waterous
   b. Mueller a-423 Centurion
   c. Clow Model 2546 Medallion
2. On any new home or building installation, accessible fire hydrants are to be installed before combustible construction commences and said fire hydrants are to be in good working order with an adequate water supply throughout the duration of construction.
3. Contractor is to call the Engineering Inspector for underground inspection, pressure and flush verification of all fire hydrants and fire lines before back filling. The Engineering Inspector may involve the City's Public Works Department.
4. Painting of the curbs and hydrant and any work necessary for protection of hydrants from physical damage is to be completed before approval.
5. A flush of all underground piping provided for fire sprinkler connection will be witnessed by the Fire Department.
6. A flow test must be witnessed by the Fire Department prior to occupancy for verification of required on-site water supply.
7. All on-site fire main materials must be U.L. listed and A.W.W.A. approved.

8. Fire Hydrant Spacing:
   - Refer to Appendix B & C of the 2006 International Fire Code for fire hydrant quantity and spacing.
9. Where new water mains are extended along streets, hydrants are to be spaced at maximum 1,000-foot spacing to provide for transportation hazards.
10. No fire hydrant is to be located within 10-feet of any curb return, driveway, power pole, street light or any other obstruction.
11. Fire flow shall not exceed a water delivery rate of 10 cfm. Two sources of supply are required whenever there are four or more fire hydrants installed on a single system.
12. Not more than two hydrants can be out of service due to a single main break.
13. Fire apparatus access roads are to have an unobstructed width of not less than 20-feet provided no parking is allowed, not less than 28-feet if parallel parking is allowed on one side, and not less than 36-feet if parallel parking is allowed on both sides. Vertical clearance is to not be less than 13-feet, 6-inches and is to be paved.
14. A 50-foot design vehicle shall be used during fire access road design. The turning radius for any fire apparatus access road and/or fire lane, public or private, is to be designed for a turn of not less than 50-feet outside radius and 28-feet inside radius and is to be paved.
15. A fire apparatus road is to be required when any portion of an exterior wall of the first story is located more than 150-feet from Fire Department vehicle access roads and/or fire lanes, public or private, in excess of 150-feet in length is to be provided with an approved turn around area.
16. Access roads are to be marked by placing approved signs at the start of the designated fire lane, one sign at the end of the fire lane and width signs at intervals of 100-feet along all designated fire lanes. Signs to be placed on both sides of an access roadway if needed to prevent parking on either side. Signs to be installed no higher than 10-feet or less than 6-feet from roadway level. The curb along or on the pavement or cement if curb is not present, is to be painted with red weather resistant paint in addition to the signs.
17. Electrically controlled access gates are to be provided with an approved Knox key switch system. Said system is to be installed in accordance with the City of West Jordan Fire Department approval. Gates are only allowed with prior approval.

F. Culinary Water Notes

1. No work is to begin until the water drawings have been released for construction by the Engineering Department. Following water drawing approval, 48-hour notice is to be given to the Engineering Department prior to the start of construction. Notice must be given before 12:00 P.M. the business day prior to an inspection.
2. All work is to conform to City of West Jordan City standard plates, drawings, and specifications and the Culinary Water Policies & Design Criteria Manual.
3. All work, except as modified by these drawings or by note 2, is to be done in accordance with the most current draft or edition of the Road and Bridge Policies & Design Criteria Manual.
4. A single pipe material is to be used throughout the project, unless otherwise approved by the Engineering Department.
5. All service laterals 2-inches in diameter and smaller is to be copper tubing with City of West Jordan City approved service saddles.
6. All water meter boxes are to be located outside of driveway areas.
7. All valves are to be located outside of driveways, gutters, curbs and alley gutters.
8. The following requirements must be met in the event a water line and sanitary sewer or storm sewer line cross:

A minimum 18-inch vertical separation (outside to outside) must be maintained when the water line is installed over the sanitary or storm sewer line. If the vertical separation cannot be maintained or the water line must be placed under the sanitary or storm sewer line, the sanitary or storm sewer line must be constructed with one of the following or, as shown on these drawings:

a. Potable water supply quality material
b. Encasement, with 4-inch concrete (minimum)
c. Sleeving with potable water supply quality pipe.

Each provision must extend along the sanitary or storm sewer, on either side of the water main, a minimum 10-foot distance perpendicular to the exterior of main.

9. Warning tape is to be required over all mains, all 6-inch diameter and larger service laterals, and any service lateral not installed perpendicular to the main.
10. All water facilities are to be filled, disinfected, pressure tested, flushed, filled and an acceptance water sample obtained prior to connection to the City of West Jordan distribution system.
11. The Contractor/Developer is responsible for providing all residential water meters in accordance with the City's specifications for such meters. Contractor/Developer is also responsible for installing the temporary construction water hydrant and ¾-inch & 1-inch water meter as indicated in CW-115 and CW-115A.
12. The Contractor/Developer must obtain all meters 1 1/2-inch and larger from City of West Jordan Public Works Department – 48-hours prior to pick-up.
13. Construction may interrupt service, with City of West Jordan Engineering Department and Public Works Department approvals and proper notification, between the hours of 10:00 P.M. and 6:00 A.M. Sunday through Thursday. Circumstances that may require temporary service feed must have prior City of West Jordan Engineering and Public Works departments' approval.
14. All water facility construction materials used must be as listed on the City of West Jordan Engineering Department's pre-approved materials and manufacturers listing for new facilities, latest revision, or specifically approved on these drawings.
15. Approval of these drawings for the water used stub out installation is not to be construed as a commitment for water service to this property.
16. Conditional approval of valved outlet (6-inch and larger)
    In the event the water drawings show one or more valved outlets extending out of paved areas, installations of these outlets is acceptable. However, if the outlets are incorrectly located or not used for any reason when the property is developed, the developer is to abandon the outlets at the connection to the active main in accordance with the City of West Jordan standards, and at the developer's expense.

16. Water Crossing Note
    The following are the requirements that shall be met when there is a water-sewer crossing:

    When protection of the water line is considered, the minimum vertical distance 18-inches must be maintained when the water line is installed over the sewer/storm line. If this distance cannot be maintained because of physical obstructions or the water line must be placed under the sewer/storm line, the sewer/storm line must be constructed with any on if the following:

    a. Extra heavy cast iron or ductile iron pipe

b. Water supply quality
c. Encasement with 4-inches minimum of concrete or sleeving with water quality pipe.

Each of these provisions must be extended for 10-feet on either sides of the water line at 90 degrees to the crossing

G. Sewer Notes

The standard notes shown on the following pages should be included on the cover sheet as applicable. They are subject to change to suit the needs of the Engineering Department.

General Wastewater Notes

1. Contractor shall notify the City of West Jordan (801) 569-5070, five (5) days prior to commencing construction.
2. All construction shall conform to the City of West Jordan Engineering Department Wastewater Policies & Design Criteria Manual adopted by the City Council.
3. (Note concerning pipe type).
4. Warning: Connection to existing wastewater shall be done only In the presence of the City of West Jordan Engineering Department Inspector.
5. The location of, and existence or non-existence of underground utilities has been determined to the best of the Engineer's ability, but it shall be the sole duty of the Contractor to verify the location of the existing utilities and to take all necessary precautions to avoid damage to these utilities. The Contractor shall assume sole responsibility for any damage done to existing utilities during construction.
6. Separation between wastewater and water lines shall be in accordance with Standard Drawing No. CW-21 of the City of West Jordan Policies & Design Criteria Manual.
7. All trench backfill and compaction in public right-of-way above the pipe zone will be under the supervision of the City of West Jordan Engineering Department.
8. The Contractor shall maintain a record of the locations of all wastewater laterals, tees and stub outs. This record shall be delivered to the Developer's Engineers prior to final payment being authorized.
9. Backwater devices shall be installed where necessary.
10. The Contractor shall mark the location of all wastewater laterals with the letter "s" at least 2-inch high engraved into the curb.
11. All laterals to new pipelines are to be tied into main line through use of fittings. Cut-in saddles are not allowed.
12. The wastewater system shall be completed and accepted by the City Council prior to the issuance of a Certificate of Occupancy.
13. Wastewater lines will be internally inspected by a City television crew at the owner/developer's expense.
14. The house laterals shall be extended beyond the street right-of-way to edge of P.S. E. (public service easement).

H. Landscape & Irrigation Notes

1. Changes to irrigation system design or landscaping design, must be submitted to the City's Engineering Department and the City's Parks Division, for approval. Changes will be processed through the City's Change Order process.
2. All Developers/Contractors shall comply with the City of West Jordan Irrigation & Planting Policies & Design Criteria Manual, when installing an irrigation system and landscaping.
3. All landscape and irrigation must be maintained by the Developer/Contractor, until the Contractor/Developer receives an approved letter from the Engineering Department and the Parks Division, stating that the landscape and irrigation is the City's to maintain.
4. All Developers/Contractors shall submit, to the Engineering Department, two copies of an approved set of landscape and irrigation drawings, prior to the warranty period inspection. One of the approved set of drawings will be forwarded to the Parks Division for their information and use.
5. All Developers/Contractors shall submit, to the Engineering Department, two sets of "As – Built" drawings, prior to the final bond release inspection. One of the sets of "As-Built" drawings will be forwarded to the Parks Division for their information and use.
6. The Engineering Department and Parks Division will review all landscape and irrigation designs/drawings, prior to any construction taking place. If designs/drawings have not been reviewed, the project will not be accepted by the City.
7. The Contractor/Developer shall install an irrigation controller compatible to the City's central irrigation system. The Contractor shall also be responsible for the complete installation and programming of the irrigation controller, throughout the entire warranty period. The City will require the Contractor/Developer to purchase a key pad which will enable the Contractor/Developer to program the irrigation controller. The Parks Division will not install or program any irrigation controller that has not been accepted by the City.
8. All Contractors/Developers must follow a five step inspection process, when installing irrigation and landscaping. The inspection process can be found in the Irrigation & Planting Policies & Design Criteria Manual.
9. All street improvements (irrigation, landscaping, planting) are to be specified on the drawings. The drawings shall also show who is responsible for future maintenance of the newly installed landscape and irrigation systems.

4.9 PLAN CHECK

Two plan check reviews are provided as part of the engineering review fees. The Developer will be charged on an hourly basis for each subsequent plan check, which must be paid to the City's Finance Department prior to the Engineering Department reviewing the drawings.

4.10 ENGINEERING DEPARTMENT APPROVAL

Once the Engineering Department staff has reviewed all corrections to the plans and have verified that the requested changes have been made, the plans will be submitted to the Engineering Department for review and approval. The ODA will then notify the Developer in writing of that approval.

4.11 EASEMENT AND FEE PARCEL DEDICATIONS

The Developer is to verify to the Engineering Department's satisfaction that all easement and fee parcels needed for the project have been dedicated to the City. The Developer is to submit such recorded documents to the Engineering Department for their files.

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SECTION 5.0

PLAN REVIEW & APPROVAL

5.1 GENERAL

A. General - The process of City staff review and correction of Developer provided landscaping & irrigation 'Released for Construction Drawings (RFCD)' is discussed in this Section. The review of these RFCDs has been less defined in the past, and the purpose of this document is to outline what needs to be prepared and reviewed, and who does that work. Building elevations, plats, site plan drawings, construction drawings for other public infrastructure, reports, studies, calculations, and other documents used in the processing of a private development project through the City will be address in other Manuals.

The process of reviewing these RFCDs is called the *'Redline Review Process'*. *'Redlines'* refer to those hand written corrections, usually written in red pencil or pen, on RFCDs, and other hand-written or typed documents, which provide direction to the Developer and his/her engineer/architect on what items need to be changed on these documents. They also include written documentation of alternatives the Developer might consider in order to meet the City's requirements, or optional suggestions the Developer might wish to consider in finalizing his/her project.

The process is initiated by the Developer submitting ***all*** of the RFCDs and required documents the City has indicated are necessary for the review of this specific project. ***All*** of the RFCD documents required by the City must be provided at the time of submittal after application, or the City staff will return the submitted materials back to the Developer, mark those documents that are missing on an appropriate checklist, and require that the Developer obtain the other documents prior to submitting the application packet back to the City. City staff will inventory the documents to ensure all of the documents are present, and the City's Project Review Team will complete the detailed review of the documents later. The City's project planner, engineer, Public Works staff, and other City staff involved in the review of the RFCDs are referred to as the City's 'Project Review Team', and they will be responsible for reviewing the RFCDs and processing them through the City.

B. Purposes of Redlines – The purposes of the *'Redlining'* process are as follows:
   1. Explain and clarify the City staff's comments regarding various documents they have reviewed which were provided to the City staff for review as part of the private development project.
   2. Create documentation, which sets the standard for what will be required of the project, in order for it to be processed through the City.

C. Types of Comments – Redline comments come in three distinct types, they are:
   1. Comments Required to meet Code, standard, manual or other Planning Commission and/or City Council conditions or approved requirements - These are comments the Project Review Team will make on *'redline'* documents which are required by the City of West Jordan Municipal Code, standards, manuals, or other Planning Commission or City Council approved documents. These are required to be complied with by the Developer and his/her engineer and other professionals and are not optional for them to consider. If the Developer wishes to contest these requirements, they must be done through the appeal

process set forth in *'Section 5.8 – Developer's Appeal Process'* of this Section, and or the Municipal Code. City staff does not have the authority to waive or change these requirements.

2. Alternatives for Code, standard, manual or other Planning Commission or City Council approved requirements – There are situations where a given project may have alternatives City staff may indicate are available to the Developer to meet City Code, standards, or manual requirements. These will be indicated in a separate *'Project Redline Memorandum'* which will detail the alternatives available to the Developer, along with any other information City staff may wish to communicate to the Developer for his/her consideration. It the responsibility of the Developer to weigh and select a given alternative and indicate so in writing to the Project Review Team. The project will not proceed with further review until the Developer provides this written decision.
3. Optional suggestions – There may also be optional suggestions the Project Review Team wishes the Developer to consider in the remaining preparations for the project. These will also be included in the *'Project Redline Memorandum'* and will be included under the heading of *'Optional Suggestions'*. The Developer must provide a written response to whether these suggestions will be included in the project and can be included with the *'Alternatives for Code Compliance'* items.

C. Types of Redline Documents – *'Redline Documents'* typically include *'Released for Construction Drawings'*, studies, reports, calculations, and any other type of document which may be submitted to the Project Review Team in order to adequately address City requirements for a given project. The Project Review Team will mark on these *'Redline Documents'* any corrections, which may be necessary to meet City requirements. Redline comments are to be prepared after reviewing the City's Municipal Code, standards, and manuals.

D. All Redlines Must be Addressed in Order to Process Project – The Developer needs to note that all redlines must be addressed to the satisfaction of the City staff before the City Planner and City Engineer will schedule the project for Planning Commission or City Council review.

E. Private versus Public Projects – In the case of landscaping and irrigation *'Released for Construction Drawings',* a project may contain both landscaping and irrigation areas which will ultimately be dedicated to the City for the City's operation and maintenance, which we will designate as *'public'*, and landscaping and irrigation areas which will be maintained by private entities or individuals, these we refer as *'private'*. Both *'public'* and *'private'* areas of landscape and irrigation are subject to the same level and quality of design, materials and workmanship. Both will have bonding requirements, but once the areas are acceptable to the City and eventual long-term owners, the bonds will be released per code, and they will then be maintain by the City, if they are *'public'*, and by private entities, if they are *'private'*.

F. Irrigation Water Meters – Design, specifying, and construction of water meters for landscaping and irrigation projects are subject to a separate Manual, the *'Water Policies & Design Criteria Manual'*. Pleases refer to this Manual when dealing with water issues. All of the information needed is contained in this document. It should also be noted that it has been determined that no water impact fee will be required for water meters which provide solely for a separate irrigation service.

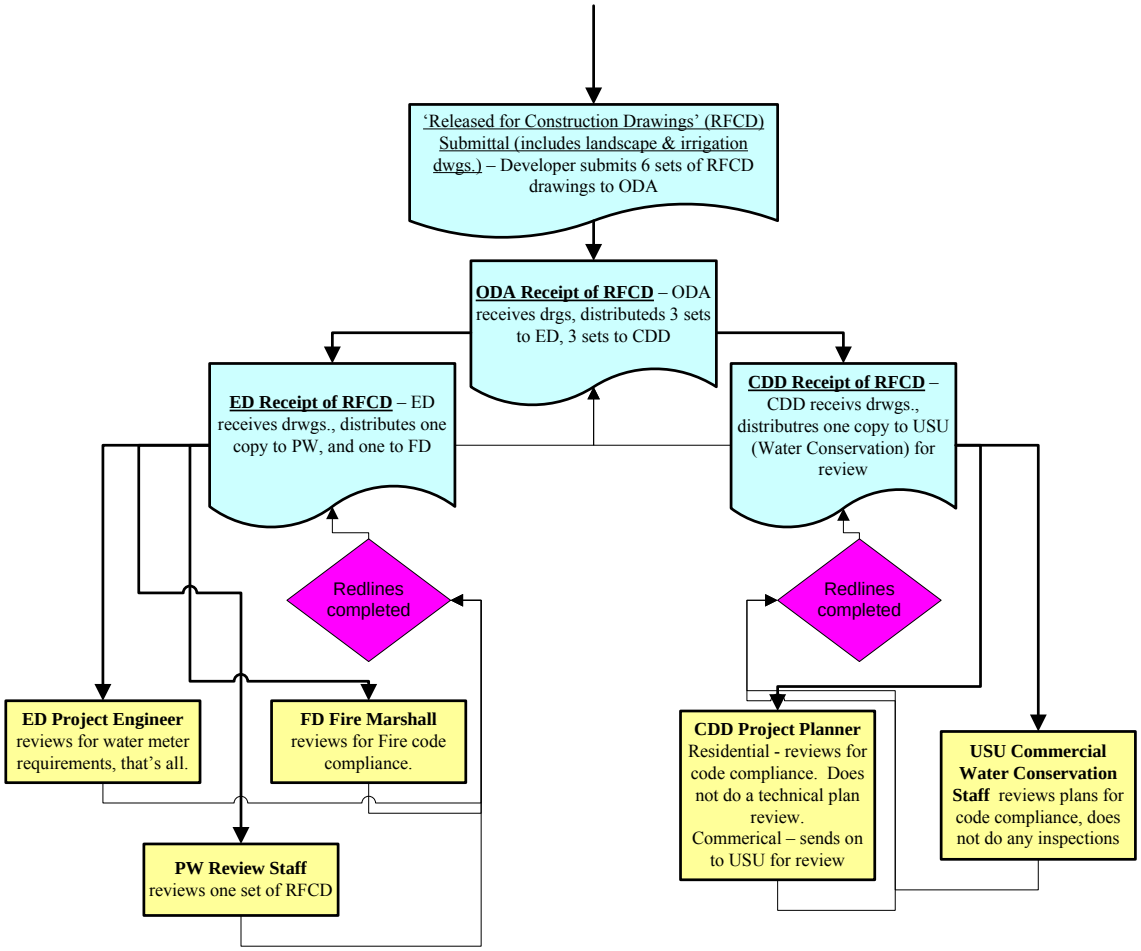
5.2 'RELEASED FOR CONSTRUCTION DRAWINGS' RECEIPT AND DISTRIBUTION PROCESS

Once the Developer delivers his project's *'Released for Construction Drawings'* to the City, they will then be distributed to various departments for review and comment. This includes the Engineering, Community Development, Public Works, and Fire departments. If the project is a commercial project, it will also be distributed to Utah State University for a water conservation compliance review.

The entire RFCD set of drawings will remain in one stapled set, and drawings will not be removed for separate review. Six (6) sets of RFCD are required to be submitted to the Office of Development Assistance (ODA), who will the have the ODA Project Manager distribute these 6 sets. Three (3) sets of RFCD will go to the Engineering Department, and 3 sets will be given to the Community Development Department for processing.

Please see the following flowchart for additional information regarding the distribution and review of the RFCD.

Flowchart 5.2.1 – Landscape & Irrigation Drawings Distribution and Review Process



ED – Engineering Department
CDD – Community Development Department
FD – Fire Department
ODA – Office of Development Assistance
PW – Public Works Department
USU – Utah State University

5.3 CITY DEPARTMENT RESPONSIBILITIES FOR REVIEW OF 'RELEASED FOR CONSTRUCTION DRAWINGS' AND CODE

Various City departments have responsibility and appropriate training to oversee and supervise various portions of work required to process the landscape and irrigation *'Released for Construction Drawings'* and other related documents.

The following table provides a summary of which City department or outside agency is responsible for the various drawings sheets, code compliance reviews, or other work related to the project's landscaping and irrigation approvals.

Table 5.3.1 – Drawing/Code Review and Responsibility for Review

Landscaping & Irrigation Drawing/Standard/Code	Primary Review Respon.	Secondary Review Respon.
Released for Construction Drawings (see below in *italics)*		
Cover Sheet	ED	PW
Abbreviations, Legends and Index Sheet	ED	PW
General Notes Sheet	ED	PW
Typical Sections Sheet	ED	PW
Survey Control Plan Sheet	ED	
Overall Site Plan Sheet	ED	PW, CDD, FD
Overall Utility Plan Sheet	ED	PW, FD
Site Demolition Plan Sheet	ED	PW, CDD
Layout Plan Sheet	PW	CDD
Dimension Plan Sheet	PW	CDD
Overall Grading and Master Storm Water Drainage Plan Sheet	ED	PW
Grading and Storm Drainage Details Sheet	ED	PW
Overall Storm Water Pollution Prevention Plan Sheet	ED	PW
Landscape Plan Sheet	PW	CDD, USU
Irrigation Plan Sheet	PW	CDD, USU
Site Details Sheet	PW	ED
Landscape Plant Schedule Sheet	PW	CDD, USU
Landscape Details Sheet	PW	CDD, USU
Irrigation Details Sheet	PW	
Quantity and Schedule Sheet	PW	ED
Other Issues/Reviews		
Released for Construction Drawing Set (as a whole)	ED	PW, CDD
Fire Code Issues	FD	
Water Meter Size and Location	ED	PW
Commercial Projects – Water Conservation Code Compliance	USU	CDD
Code Compliance Review – No. of trees and shrubs	CDD	
Code Compliance Review – Total % of landscaping	CDD	

Notes:
CDD – Community Development Department
ED – Engineering Department
FD – Fire Department
PW – Public Works Department
USU – Utah State University

5.4 PROJECT REVIEW TEAM'S RESPONSIBILITIES IN THE REDLINE REVIEW PROCESS

The Project Review Team is responsible for reviewing the documents submitted by the Developer in accordance with the established Municipal Code, standards, policies and design criteria manuals, specifications, the Development Processing Manual, and any other City Council approved documents meant for this purpose.

The Project Review Team will mark on the drawings, studies, or reports, any corrections that are necessary in order for the project to meet the requirements indicated above. The Project Review

Team will indicate the Code, standard, or manual requirement, which applies to the comment. If the Developer does not agree with the Project Review Team's interpretation of regulations, or wishes to challenge the requirement, the Developer needs to understand that City staff does not have the authority to waive, or not enforce these requirements. These are City Council approved requirements, and only the City Council can change or alter the requirement. The Developer will need to follow the appeal process outline in *'Section 5.8– Developer's Appeal Process'* or Municipal Code appeal process.

In addition to the *'redline'* marking of *'Released for Construction Drawings'*, or other studies and reports, City staff will also provide a separate hand-written or typed document called a *'Project Redline Memorandum'*, which provides alternatives to the Developer for meeting the City's codes, standards or manuals. The review will be based on code, general plan, standards and specifications. As part of this effort, the Project Review Team will provide a written description of what the alternatives are, any concerns that City staff may have regarding the alternatives, pros and cons they may be aware of, and other items which may be useful in the Developer's decision on which alternative to select. The Developer will then choose the course of action he/she wishes to follow. The Developer must indicate, in writing, to the Project Review Team which alternative he/she elects to select. ***The project cannot be further processed until the Project Review Team receives this document.***

City staff may also elect to provide *'Optional Suggestions'* they wish the Developer to consider in finalizing the project. These will be included in the *'Project Redline Memorandum'* under the heading of *'Optional Suggestions'*. The Developer is not required to include these suggestions in the next version of corrected documents for the project, but must provide in writing, an indication as to whether he/she intends to include them in the project.

City staff's responsibility is to be as clear as possible in defining the issue(s) for the Developer, so the Developer and his/her engineers/architects understand the issue(s), and what the resolution to the issue(s) may be. Typically there will be one to three *'redline reviews'* produced for a given project, unless the Developer and his/her engineer/architect are not adhering to the *'redline'* comments, and additional *'redlines'* are required. If the Developer's project requires more than 3 sets of 'redlines', the Developer will be charged extra for the review of these additional sets of *'redlines'*.

5.5 DEVELOPER'S RESPONSIBILITIES IN THE REDLINE REVIEW PROCESS

The Developer and his/her engineer/architect have responsibilities for making the *'redline'* process a productive and efficient effort.

The first responsibility the Developer and his/her engineer/architect have in the process is to understand the City's general plan, codes, standards, manuals and other documents, and that the project is planned and designed in accordance with these documents. If the Developer and his/her engineer/architect are not familiar with the City's requirements, the project will not be able to be processed as quickly as it would, if there aren't extensive 'redlines' to the project documents. The Project Review Team has extensive experience in these types of reviews and will *'redline'* all deficiencies and require they be changed to meet City requirements prior to further processing the project. Not following these guidelines will result in delays to the Developer and his/her project.
The Developer has the responsibility of making the corrections noted on the *'redlines'* if they are City code, standards, manuals, or other City Council approved documents comments. These

corrections are not optional and are required to be made. If the Developer disagrees with these requirements, the Developer is required to indicate this disagreement in writing to the Project Review Team, once the Developer has received and reviewed the 'redlines'. *'Section 5.8 – Developer's Appeal Process'* must be followed in resolving these types of issues. Possible modification of project requirements/agreements are closed once the Planning Commission and/or City Council approve the project. If modifications are requested, the plan or application must go back to the Planning Commission and/or City Council for modification.

The Developer has the responsibility to respond to alternatives for code compliance contained in the *'Project Redline Memorandum'* in writing. The Developer is required to consider the alternatives and then select one for implementation into the project. City staff may indicate a list of items available for the Developer to consider in this process, but the decision to select one alternative over another is solely for the Developer to make.

The Developer has the responsibility to consider optional suggestions, but is not required to comply with these suggestions. The Developer does have the responsibility of responding to Project Review Team about whether he/she intends to implement these suggestions into the project.

The Developer and his/her engineer/architect have the responsibility of being as clear as possible in responding to the concerns expressed by the Project Review Team on the *'Redline Documents'*, so the Project Review Team understands the Developer's concerns, and what the Developer's proposed resolution to the concern(s) may be.

5.6 TYPES OF REDLINE DOCUMENTS

A. Building Elevations – One of the documents which may be redlined are the building elevations, if a pavilion or other such structure is associated with the landscape and irrigation project. These drawings depict the appearance of the structure from various vantage points and provide the Developer and City staff an opportunity to review the outward appearance of the structure to ensure it meets the City's codes and other requirements.

B. Released for Construction Drawings – These are specific drawings produced by engineers and architects, and used by engineers, contractors, and others in the actual construction of the project. They consist of a number of different types of drawings as indicated in Table 5.3.1. The City requires that *'Released for Construction Drawings'* be provided and followed in the construction of approved projects.

C. Studies and Reports – Projects may require the preparation of various types of studies and reports in order to quantify issues related to the project. These may include geotechnical reports, geologic reports, traffic impact studies, drainage studies, development plans, modifications of various master plans, etc., which may be required for the individual project. The Project Review Team will identify which reports are necessary at the beginning of the project and may require additional studies/reports as work on the project progresses.

D. Other Types of Documents – Each project is unique and may require other types of documents to be submitted for the project to be processed. As the project is processed through the City, the documents will become evident and will be indicated to the Developer by the Project Review Team.

5.7 REDLINES

The Project Review Team will provide responses to the Developer's project submittals in three different forms. These are:

A. *'Project Redline Memorandum'* – In every case, the Project Review Team will assemble a *'Project Redline Memorandum'* which indicates the status of the project and provides code requirements, *'Alternatives for Code Compliance'* issues, *'Optional Suggestions'*, and any other comments the Project Review Team feels will help the Developer revise the *'Redline Documents'* and allow them to be further processed. The Memorandum may or may not include the items listed above, depending upon the needs of the specific project. This Memorandum will act as a summary of the 'redline' effort by the City staff.

B. *'Redlined Drawings'* – Most projects will contain some type of drawing or drawings. The Project Review Team may mark on these drawings any changes they wish to see made, as long as the comments were identified *as 'code requirements'*, *'alternatives'*, or *'Optional Suggestions'*, or they may include this discussion in the *'Project Redline Memorandum'*.

C. Other Redline Documents – There are a variety of these types of documents and the Project Review Team may mark on these documents, or may include a summary of concerns in the *'Project Redline Memorandum'*.

The Developer needs to check all documents for comments, which are returned to the Developer from the Project Review Team.

5.8 DEVELOPER'S APPEAL PROCESS

The *'Appeals Process'* to the Project Review Team's conditions and corrections as part of the 'Redline review process' is contained in the City's Municipal Code. This includes Title 89-1-201 and 89-2-303. Please refer to these sections for additional information regarding this process.

It needs to be noted that the appeals process will take time and will delay the Developer's project until a resolution of the issues can be finalized.

5.9 LANDSCAPING AND REVEGETATION BONDS

Separate landscaping and revegetation bonds are required for these types of projects and are further described in Title 72 – Public Works, Chapter 10, Part 3. Public Improvement Guarantees. Please keep in mind that the landscaping and revegetation bonds have different requirements and release time periods than those of the normal public improvement bond.

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SECTION 6.0

PLANTING SPECIFICATIONS

6.1 INTRODUCTION

A. General – All irrigation work shall be inspected and approved 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.

B. Scope of Work
   1. The work consists of furnishing all equipment, labor and materials necessary for the planting of areas indicated on the plans.
   2. 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.

C. Changes From Drawings - 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.

D. Obstructions below Ground (Blue Stakes 1-800-662-4111).
   1. Prior to excavation for planting or the placing of stakes, the contractor shall locate all electrical cables, conduits and other utility lines so that proper precautions may be taken. In the event of a conflict between utility lines 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.

6.2 SPACING OF PLANT MATERIAL

A. When plant material is organized in rows, all plants shall be equally spaced. Where plants are placed in a meandering fashion, spacing shall be as shown on the Landscape Plan. Ground cover shall be planted at the spacing indicated for each individual plant in the Plant Schedule on the Planting Plan.

6.3 PLANTS TO BE FURNISHED

A. General - The Developer/Contractor shall furnish plants as listed on the Landscape Plan. All quantities and sizes shall be as follows:
   1. All shrubs shall have a minimum height or spread of 18 inches depending on the plant's natural growth habit. Plants in 5 gallon containers will generally comply with this standard.
   2. All deciduous trees shall be a minimum of 2-inch caliper, measured 6-inches above the planted ground level. Evergreen trees shall be a minimum of 5-feet in height. The location of all trees shall be approved by the Parks Division prior to installation.

B. The developer shall pay the cost of installation of parkway trees. Parkway trees shall be installed on all designated streets.

C. 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.

D. All plants shall 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 Nursery and Landscape Association. Final determination of plant species or variety will be made by the Parks Division.

E. 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 rendered unsuitable as samples will not be accepted by the City and must be replaced at the Contractor's expense.

6.4 SUBSTITUTIONS

A. General - No substitutions for the approved plants will be permitted unless approved in advance by the Planning Division and Parks Division. Any substitutions shall be of the same quality and size equal to that specified on the plans. Except for the variations so authorized, all substitute plant materials shall conform to the requirements of these specifications.

6.5 FINISH GRADING AND SOIL PREPARATION

A. General - Finish grading shall consist of the following:
   1. Planting areas shall conform to the uniform grade by floating or hand raking.
   2. It shall be the responsibility of the landscape contractor to insure proper drainage. Surface drainage shall be modeled to 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 2inches below grade of adjacent pavement of any kind. Roll all lawn areas with a water-filled roller to obtain uniform compaction and level surfaces (50-pounds minimum weight). One-percent (1%) fall from a structure.
   4. Import 4-inches to 6-inches of screened sandy loam topsoil.

6.6 PLANTING

A. Sod
   1. 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.
   2. Rake these areas as specified under soil preparation, until the surfaces are smooth and of uniformly fine texture, immediately prior to planting the turf.

3. Finish grade of all sod areas will be such that after the sod is installed, the finish grade will be between zero and 1/5-inch below the sidewalk or adjacent pavement areas. Sod to be delivered one (1) day prior to installation.
4. Roll sod bed after grading with a water roller (50 pounds minimum weight).
5. One day prior to installation of sod, seeding, or hydro seeding, apply 16-16-8 commercial fertilizer at the rate of 2-pounds per 1,000-square feet.
6. Lay sod with staggered seams. Sod should be kept moist during installation.
7. 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 insure positive contact with soil. Irrigations should then begin.

B. Ground Cover
1. Prepare ground cover areas as specified under soil preparation, including commercial fertilizer (16-16-8) at the rate of 2 pounds per 1,000-square feet not less than one (1) day prior to placement.
2. Spacing of ground cover shall be in the Plant Schedule on the Planting Plan.

C. Tree and Shrub Location
1. The spacing and species of trees shall conform to City ordinance.
2. Location: Trees shall be kept not less than:
   a. Thirty-feet (30-ft) back of projected intersection of curb lines, outside of the clear vision area.
   b. Twenty feet (20-ft) from lamp standards and power poles.
   c. Ten feet (10-ft) from fire hydrants.
   d. Ten feet (10-ft) from driveways.
   e. Five feet (5-ft) from service walks.
   f. Five feet (5-ft) from water meters.
   g. When planting trees next to school signals use the Manual on Uniform Traffic Control Devices, Section 7D-13, Table VII-1. The table is as follows:

Table 6.6.1
MUTCD 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

D. Tree and Shrub Planting

1. Set out trees and shrubs in the beds in the location where they are to be planted and receive approval prior to planting.
2. Excavate a planting hole that is two to three times the diameter of the root ball to a depth at which the root flare (or root collar) will be at least 2-inches above finish grade. Trees shall be placed on undisturbed soil at the bottom of the planting hole.
3. Place the plant in the hole. If plants are balled and burlap, remove at least the top one-half to two-thirds of the wire basket and burlap, and all twine prior to back filling. Wire baskets shall be cut, and twine and wrappings shall be cut and removed as backfilling operations are completed.
4. All tree holes shall be backfilled in 12-inch lifts using soil that was removed from the hole and settled and tamped to minimize any settling of the tree.
5. Upon completion of backfilling operation, thoroughly water the tree to completely settle the soil and fill any voids that may have occurred.
6. Pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches. Proper pruning techniques shall be used. Do NOT leave stubs and do NOT cut the leader branch. Improper pruning shall be cause for rejection of the plant.
7. Mulching: Upon completion of all planting operations, remove all undesirable material from the surface of the planting beds, including all rocks over the size of ½-inch diameter; re-establish all watering basins and spread a three inch layer of mulch in all planting beds and at the base of all trees in lawn areas. Maintain a sod-free area 4-foot in diameter around tree trunks.
8. Saucers: Saucer shall be formed at the base of the tree or shrub and it shall be watered the same day as planting.
9. Tree guards. Tree guards shall be provided for all trees to protect the base of the trunk. (See standard details labeled “Tree Planting Details”).

E. Weed Barrier – A commercial strength weed barrier fabric must be installed any where sod is not laid. Examples of where weed barriers are to be used: under mulch, wood chips, around trees in tree grates.

F. Staking - Staking shall only be performed if necessary; i.e., top heavy, tipping out, etc. (See”Tree Planting details”).

G. Tree Grates - Where tree grates are required the following standards apply:
   1. The tree grate shall be iron or ductile iron.
   2. The tree grate shall be 5-feet square and shall not penetrate the sidewalk or curb. (See detailed drawing).
   3. The openings between bars shall be 3/8-inch or less for pedestrian safety.
   4. The opening provided for the tree shall be a minimum of 12-inch in diameter, but not over 16-inch in diameter. Openings shall be easily expandable for future tree growth, without losing their structural integrity.
   5. Tree grates shall be painted flat black.
   6. A commercial strength weed barrier fabric shall be installed underneath the tree grate. When installing fabric, leave a 12-inch diameter hole for the tree.

H. 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 lawn and turf shall be adequately irrigated until the Parks Division has given approval of the project to the City Engineer and the Developer. Water 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 cutting, water lawn to maintain a thriving condition.
2. At completion of the maintenance period, all areas including sidewalks and gutters shall be clean and free of debris and weeds. All plants shall be live, healthy, free of infestations or weeds, and be of acceptable growth until the 100-percent bond release. The contractor shall obtain a written release from the Parks Division before ending maintenance obligations.

   * Corrections & Replacements: Done immediately prior to start of maintenance period.

   West Jordan City Parks Division
   8030 South 4000 West
   West Jordan, Utah 84088
   (801) 569-5706

   Inspection scheduling:

   Call 301-6057 for scheduling of all irrigation and landscape inspections.
   Call 301-6057 to contact the City's Irrigation Specialist.

6.7 APPROVED STREET TREES

The following is a list of street trees approved for use in the City of West Jordan.

Table 6.7.1
Approved Street Tree List - 2003

Botanical Name	Common Name	Mature Size H X W	Maximum Spacing
Small Street Trees			
Acer griseum	Paperbark Maple	25' x 20'	20' o.c.
Acer tataricum	Tatarian Maple	20' x 15'	12' o.c.
Acer truncatum	Shantung Maple	25' x 20'	20' o.c.
Celtis reticulata	Netleaf Hackberry	25' x 25'	20' o.c.
Crataegus sp.	Hawthorn	20' x 15'	15' o.c.
Koelreuteria paniculata	Goldenrain Tree	25' x 25'	20' o.c.
Prunus maackii	Amure Chokecherry	25' x 25'	20' o.c.
Pyrus calleryana	Flowering Pear	25' x 20'	20' o.c.
Sorbus aucuparia	European Mountain Ash	25' x 20'	15' o.c.

Botanical Name	Common Name	Mature Size H X W	Maximum Spacing
Syringa reticulata	Japanese Tree Lilac	25’ x 20’	20’ o.c.
Medium Street Trees			
Acer campestre	Hedge Maple	30’ x 20’	15’ o.c.
Carpinus betulus fastigiata	Pyramidal Hornbeam	40’ x 30’	25’ o.c.
Cladrastis lutea	Yellow Wood	40’ x 20’	25’ o.c.
Fraxinus velutina	Velvet Ash	40’ x 30’	25’ o.c.
Gleditsia triacanthos inermis	Thornless Honey Locust (several varieties)	35’ x 25’	25’ o.c.
Tilia cordata	Little Leaf Linden	40’ x 25’	25’ o.c.
Ulmus parvifolia	Lacebark Elm	40’ x 25’	25’ o.c.
Large Street Trees			
Acer pseudoplatanus	Sycamore Maple	50’ x 30’	25’ o.c.
Celtis occidentalis	Common Hackberry	50’ x 40’	30’ o.c.
Fagus sylvatica	European Beech	75’ x 50’	40’ o.c.
Fraxinus pennsylvanica ‘Marshall Seedless’	Marshall Seedless Green Ash	50’ x 50’	30’ o.c.
Fraxinus pennsylvanica ‘Patmore’	Patmore Seedless Green Ash	50’ x 40’	30’ o.c.
Ginkgo biloba	Ginkgo	50’ x 30’	30’ o.c.
Quercus robur	English Oak	50’ x 30’	30’ o.c.
Quercus rubra	Red Oak	80’ x 50’	40’ o.c.
Tilia euchlora	American Linden	50’ x 25’	30’ o.c.
Tilia tomentosa	Silver Linden	45’ x 30’	25’ o.c.
Zelkova serrata	Japanese Zelkova	50’ x 40’	30’ o.c.

Other tree species may be considered by the Urban Forester upon written request from a property owner and/or developer of land in West Jordan.

6.8 UNACCEPTABLE STREET TREES

The following is a list of street trees which are unacceptable to the City and will not be approved for use in the City of West Jordan.

Table 6.8.1

List of Unacceptable Street Tree List

Aspen
Balm-of Gilead
Birch (all species)
Black Locust
Box Elder
Catalpa
Chinese Date
Cottonwood (all species)
Flowering Plum
Fruit-bearing or nut trees (all species)
Gambel Oak
May Day Tree
Mulberry (all species)
Poplar (all species)
Russian Olive
Saskatoon Serviceberry
Siberian Elm
Silk Tree
upright-growing conifers (all species)
Willow (all species)

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SECTION 7.0

CONSTRUCTION INSPECTION

7.1 INTRODUCTION

A. General – The construction of a project which includes public and/or private landscaping and irrigation systems is designed, reviewed, approved, inspected and accepted by several different departments within the City. The review and approval process is best defined by reviewing *'Table 5.3.1. – Drawing/Code Review and Responsibility for Review'*. As you will see, the Engineering, Community Development, Public Works, Fire Department, and Utah State University all have responsibilities for the review and approval work required for the landscape and irrigation portions of these projects.

The same thing applies for construction inspection and acceptance of the landscape and irrigation systems portions of these projects. Below is a table which indicates which department is responsible for what inspection and approval.

The Table contains three (3) categories which need additional explanation. These include the *'Released for Construction Drawings' Responsibility/Inspections'*, *'Milestone Inspections'*, and the *'Other Issues/Inspections'* sections of the Table. Developers and Contractors need to make special note of the various responsibilities and inspection requirements so that time is not wasted.

The *'Released for Construction Drawings Responsibility/Inspections'* portion of the table indicates which department has primary and secondary responsibility for issues related to these individual sheets of the *'Released for Construction Drawings'* set of drawings. If there are issues or concerns related to these sheets, these departments will address these concerns.

The *'Milestone Inspections'* section of the Table is included to indicate specific inspections which must be scheduled, and passed prior to moving on to the next phase of work. Please contain the department indicated at least 24-hours in advance, prior to needing these inspections. If the Developer or his/her Contractor cover up work, or move on to the next phase of work, the Contractor will be required to uncover his/her work so that it can be properly inspected as indicated.

The *'Other Issues/Inspections'* portion of the Table provides information regarding who to contact should the Developer or Contractor have questions during construction. These items also need to be addressed to go into the Warranty period, or come out of the Warranty period and some bond releases.

Table 7.1.1 – Inspection/Drawing Sheet/Code Responsibility

Landscaping & Irrigation Drawing/Standard/Code/Inspection	Primary Inspection Respon.	Secondary Inspection Respon.
'Released for Construction Drawings' Responsibility/Inspections		
Survey Control Plan Sheet	ED	
Overall Site Plan Sheet	ED	PW, CDD, FD
Overall Utility Plan Sheet	ED	PW, FD
Site Demolition Plan Sheet	ED	PW, CDD
Layout Plan Sheet	PW	CDD
Dimension Plan Sheet	PW	CDD
Overall Grading and Master Storm Water Drainage Plan Sheet	ED	PW
Grading and Storm Drainage Details Sheet	ED	PW
Overall Storm Water Pollution Prevention Plan Sheet	ED	PW
Landscape Plan Sheet	PW	CDD, USU
Irrigation Plan Sheet	PW	CDD, USU
Site Details Sheet	PW	ED
Landscape Plant Schedule Sheet	PW	CDD, USU
Landscape Details Sheet	PW	CDD, USU
Irrigation Details Sheet	PW	
Quantity and Schedule Sheet	PW	ED
Milestone Inspections*		
1st – Open main line & lateral pressure test	PW	ED
2nd – Final irrigation system & coverage test	PW	
3rd – Plant material & location	PW	
4th – Start of Warranty period	ED	PW
5th – Final release (after end of Warranty period)	ED	PW
Other Issues/Inspections		
Fire Code Issues	FD	
Water Meter Construction	ED	PW
Commercial Projects – Water Conservation Code Compliance	USU	CDD
Code Compliance Review – No. of trees and shrubs	CDD	
Code Compliance Review – Total % of landscaping	CDD	

Notes:
CDD – Community Development Department
ED – Engineering Department
FD – Fire Department
PW – Public Works Department
USU – Utah State University
*Milestone Inspections – Inspections which must be satisfactorily passed before going on to the next phase of work.

B. Outside Landscape Architectural/Engineering Firm Certifications – In the case of landscape and irrigation systems which are not public, the Developer/Contractor is required to have on staff the landscape architect and/or engineer responsible for that portion of the design, available to perform

the inspection for the work he/she designed. The landscape architect and/or engineer will also be responsible for doing inspections as indicated in Table 7.1.1. and providing a Certificate to the City's Engineering Department to the effect that the constructed work has been done in accordance with their designs. If the work was not done in accordance with their designs, approved Change Orders revising their designs must be approved prior to constructing the revised construction.

7.2 MILE STONE INSPECTIONS AND PROCEDURES

A. Limitations on Inspection Periods - Due to Utah having a limited growing season no inspections will be performed from October 31 till March 31, unless conditions permit and at the Parks Division's discretion.

B. Scheduling and Notice of Requested Inspection - The Developer is responsible for scheduling a needed inspection at least 24-hours ahead of when the inspection is required and shall do so by schedule with the Parks Division. Prior to each inspection date, the Contractor shall give twenty-four (24) hours notice to the Parks Division. There are to be a minimum of five (5) inspections. The Developer shall not proceed to the next phase of construction until the previous phase has been inspected and approved.

C. The milestone inspections are as follows:

First inspection	Open Main Line & Lateral Pressure Test
Second inspection	Final Irrigation System & Coverage Test
Third inspection	Plant material & location
Fourth inspection	Start of the warranty
Fifth inspection	Final release

D. In the event the Developer requests an inspection of the project and the work is substantially inadequate, the Developer will be responsible for payment of inspection fees as established by Resolution of the City Council.

E. After installing the irrigation main line, the Contractor is to schedule the first inspection by the Parks Division.

F. After the project is deemed satisfactory by the inspector (fourth inspection) the City Engineer will be notified that the Parks Division will sign off on the 90-percent bond reduction. The twenty-four month warranty period shall begin on the day following the official action by the City Council to reduce the improvement guarantee to the 10-percent level. The Developer is to obtain written approval from the Parks Division that the City has officially assumed maintenance, that all work has been completed to City Standards, that all required plants are still living, and that the irrigation system is in good working order.

G. At the end of the twenty-four month warranty period a fifth and final inspection will be scheduled. If all required plants are still living, the irrigation system is in good working order, and the project

is otherwise deemed to be satisfactory, notice will be given to the City Engineer that the Parks Division will sign off on the 100% bond release.

H. As-Built Drawings - The Landscape Architect/Contractor is to furnish the Parks Division with two (2) preliminary sets of plans 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 is to submit two (2) final sets of as-built plans to be signed and approved by the Parks Division. Upon completion of the installation, the Contractor/Developer shall submit a set of as-built plans to the Parks Division or Landscape Architect. The Parks Division shall receive the as-built plans prior to accepting the project for final release

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SECTION 8.0

POST-CONSTRUCTION MONITORING

8.1 IRRIGATION AUDIT

A. Irrigation Audit – This requirement applies to all landscapes measuring over 1,000-square feet. Following construction and prior to issuing the city ownership of the property, an irrigation audit shall be conducted by an Irrigation Association Certified Landscape Irrigation Auditor (CLIA) who is approved by the City. The auditor shall be independent from the contractor, design firm, and owner/developer of the project. The irrigation audit will verify that the irrigation system complies with the minimum standards required by this ordinance. The average distribution uniformity for all tested turf zones (valves) must be at least 60% for fixed/sprays zones and 70% for rotors/stream zones. All turf zones (valves) shall be tested for distribution uniformity, up to a maximum of eight (8) zones. When the irrigation system consists of more that eight (8) zones, the auditor shall select and test eight (8) turf zones, including both fixed and rotor zones, which are most representative of the system. All other zones, including drip irrigation, microspray, bubblers, or other designs, shall be turned on and inspected visually for head placement, head adjustment, appropriate gallon-per-minute emitters, pressure problems, leaks and general coverage.

   When the above audit is required, the auditor shall furnish a report to the City and owner/developer certifying compliance with the minimum requirements. Compliance with this provision is required before the City will issue the certificate of occupancy.

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SECTION 9.0

'PUBLIC IMPROVEMENT BOND' PROCESS

9.1 GENERAL

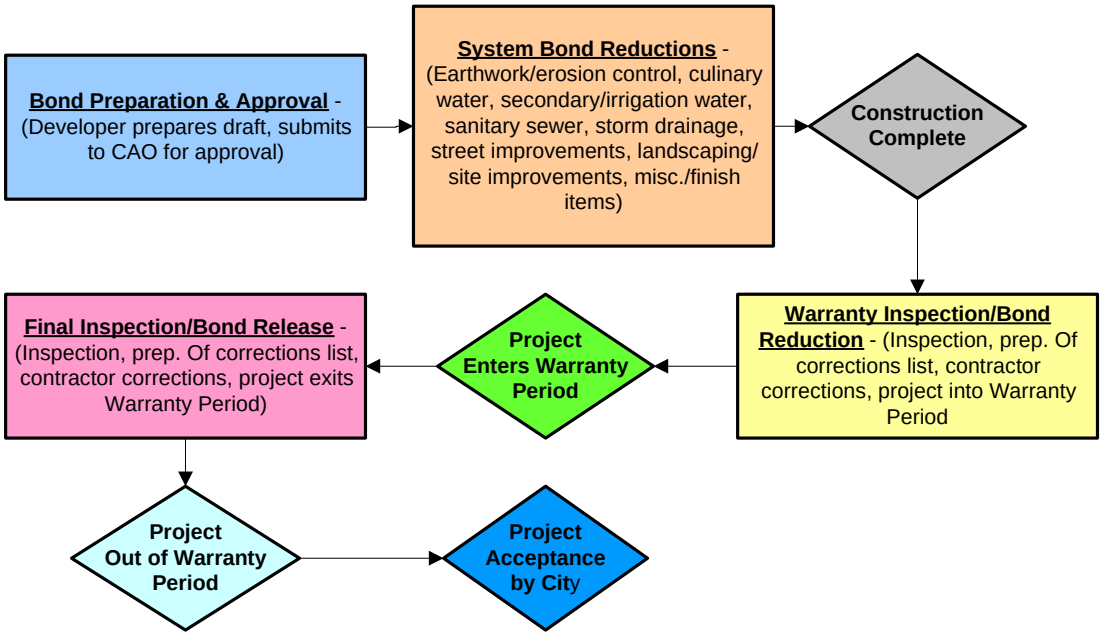
A. General – The purpose of this section is to address issues related to *the 'Public Improvement Bond'* and its various parts. There are four main parts to this process which include:

1. Bond preparation and approval *(16.3,16.4)**
2. System bond reductions *(16.5)**
3. Warranty inspection/bond reduction, *(16.6)** and
4. Final inspection/bond release *(16.7)**

**Note: Denotes subsection references.*

The *'Public Improvement Bond'* consists of processes as shown below:

Flowchart No. 9-01 Overall Public Improvement Bond Process



B. Municipal Code – As indicated above, bond preparation, establishment, reductions and releases are specified in various sections of the City Municipal Code. Developers, their contractors and staff are to be familiar with the various provisions of the Code and how they might apply to the various bonds described in *'Section 9.2 – Private Development Project Bonds – General'* (see Title 89-6-12).

C. Development Processing Manual (DPM) – The City has also adopted a *'Development Processing Manual'*, which is required to be followed in relation to this issue. Various

sections of the DPM have been prepared to provide a step-by-step process for preparation, establishment, reductions and releases of various types of bonds. Please refer to this Manual for additional information.

D. Private Development Construction Inspection Manual (PDCIM) – The City has also adopted a *'Private Development Construction Inspection Manual'* which is required to be followed in relation to bond this issue. Various sections of the PDCIM have been prepared to provide a step-by-step process for preparation, establishment, reductions and releases of various types of bonds. In addition, the Manual contains appendices, which include inspection and certification checklists for the various systems to be released for the Public Improvement Bonds. Please refer to this Manual for additional information.

E. Acronyms and Definitions – The following acronyms and definitions apply to this section:

1. Acronyms
   a. CAO – City Attorney's Office
   b. CDD – Community Development Department
   c. DPM – Development Processing Manual
   d. ED – Engineering Department
   e. PDCIM – Private Development Construction Inspection Manual
   f. ODA – Office of Development Assistance
   g. PWD – Public Works Department
2. Definitions
   a. Bond estimate sheet – The spreadsheet used by the Private Development Projects Division of the Engineering Department to prepare cost estimates of the public infrastructure for which bonds will be prepared. Contact the City Engineer for the most current version of this document.
   b. Bond reduction – After the bond for the project has been established, the City will allow the bond to be reduced in its amount, as progress is made on constructing and inspecting those constructions. As the bond is reduced, this is called a bond reduction.
   c. Bond release – Once the *'system-by-system'* bond reductions have been performed, the project is complete, and the project has been through its *'Final Inspection'* and all correction items completed, then the project is ready for a complete release of all bond proceeds. This is called a *'bond release'*.
   d. Certification form – A City prepared form that is used by the Developer to certify the project has reached a certain stage in construction.
   e. Contractor – This is the general contractor for the project, or may be a subcontractor for a portion of the project. In either case, it is the entity that is responsible for the construction in question, and the entity to whom the Developer looks to address a particular construction issue.
   f. Corrections list – A list of items needing to be completed or corrected for a given construction project. Is also referred to as a *'punchlist'*.
   g. Days – Unless otherwise so stated in this section, days refers to *'calendar days'*.
   h. Developer – The entity responsible from the private development side of the project, for due diligence, planning, designing, constructing, and getting the project accepted.
   i. Final inspection – That inspection that comes at the end of the Warranty Period, once all City requirements have been met.
   j. Final inspection bond release – That inspection and bond release that comes at the end of the Warranty Period, once all City requirements have been met.

k. Finish items – A category within the *'Public Improvement Bond'* list of items. It signifies those items, which are required to be completed in order to fully, complete the construction of the project, such as valve covers, street signs, etc. These are more fully defined on the *'bond estimate sheet'*.
l. Inspection checklist – These are the checklists used for inspection of the *'system'* improvements and are contained in the PDCIM in Appendices C, D, and E.
m. Manual – As used in this section, this refers to the Development Processing Manual.
n. Public infrastructure – Culinary water, secondary water, storm drainage, irrigation, roadways, fencing, etc. infrastructure construction which is to be dedicated to the City. This infrastructure is to be constructed in accordance with all requirements necessary to make them public facilities.
o. Project – The *'project'* is defined as the construction shown on the *'Released for Construction Drawings'*, and is also defined as the project reviewed and approved by the Planning Commission.
p. Punchlist – Please see *'Corrections List'*.
q. Released for Construction Drawings – This is the set of drawings reviewed and approved by the Engineering Department as part of the project approvals which are then signed by the Engineering Project Review Engineer, the City Engineer and other affected City departments.
r. System – These are the 8 items listed under *'Section 9.1 General, D. Public Improvement Bond'* which lists the 8 items considered to be *'systems'*.
s. Warranty bond reduction – This is the bond reduction, which comes after all City requirements have been met, after the Warranty Inspection has taken place.
t. Warranty inspection – The inspection performed at the time of completion of the project, and which is just prior to going into the Warranty Period.
u. Warranty period – That period of time between the Warranty Inspection and Final Inspection, when the City agrees that all items on these corrections lists have been completed, and the project meets all City requirements. The Warranty Period for the *'Public Improvement Bond'* is 2-years, and will be different for the other bonds.

F. Developer's Role – The Developer has the primary and an integral role in the preparation, establishment, reduction and release of these bonds. These responsibilities include:

1. Bond Estimate Sheet(s) - The Developer and his/her engineer, is to submit to the Engineering Department a complete bond estimate sheet(s), on the forms provided by the Engineering Department. The Engineering Department will review and either return the bond estimate sheet(s) to the Developer and his/her engineer for additional work, or will approve the draft bond estimate sheet(s) for further processing. The Developer is responsible for submitting a reasonable listing of public improvements and *'non-public improvements in common* areas' and City staff will review this work. Developer delays in submitting a reasonable bond estimate sheet(s) will result in delays in completing the bond.
2. Bond Form Preparation - The Developer is to work with the City Attorney's Office in preparing the bond form(s). The Developer is responsible for this work, not City staff. The Developer and his/her bonding company must meet the City Attorney Office's requirements prior to the bond being approved by the City Attorney's Office, and this approval being forwarded on to the Office of Development Assistance (ODA) and the Engineering Department. Developer delays in submitting the bond in the form required by the CAO, will result in delays in completing the bond(s).

3. Developer/Contractor Certification for Bond Reduction/Release - The Developer is responsible for understanding and being involved with the progress on construction of his/her project, prior to submitting a written bond reduction or release request. Manyu times, the Contractor indicates he is ready for a bond reduction or release, when this is not the case. As such, the City has prepared a *'certification form'* for the various *'systems'*, which the Developer and his contractor are to complete as part of the written reduction/release request. This form must be properly completed and submitted to the Engineering Department before the Engineering Department inspection staff will initiate an inspection of the *'system'*, for which a reduction/release is being requested. Once the *'certification form'* is completed and submitted, an inspection by Engineering staff will be promptly completed. If it is found during the inspection that the *'system'* is not ready for inspection, the Engineering inspector will return a written response to the Developer indicating the items that are not complete. Subsequent inspections after the first inspection will be billed to the Developer on an hourly rate basis.
4. Timely Completion of Corrections List (Punchlist) - Once an inspection has been conducted by the Engineering Inspector, and a Corrections List (Punchlist) has been completed, the Developer and his Contractor are responsible for making the required corrections and notifying the Engineering Inspector that the corrections have been made within 30-calendar days, or the Corrections List becomes null and void and a new Corrections List will be required to be prepared. Again, additional inspection work required of the Engineering Inspector will be charged to the Developer for this additional work.

G. City's Role – The City also has an integral role in the review of the preparation, establishment, reduction and release of these bonds. These responsibilities include:

1. Bond Estimate Sheet – City staff are responsible for a timely and complete review of the bond estimate sheet, once it is provided to the Engineering Department by the Developer. The Engineering Department will review and either return the bond estimate sheet to the Developer and his/her engineer for additional work, or will approve the draft bond estimate sheet for further processing.
2. Bond Form Preparation - The City Attorney's Office (CAO) is responsible for the review and approval of the bond agreement form. Once the CAO has completed its review, an approval of the bond will be forwarded to the ODA and ED for their information.
3. Developer/Contractor Certification for Bond Reduction/Release – City staff will review the *'certification form'* and perform an inspection on the *'system'* and will provide the Developer and Contractor a written response regarding their request within 7-days.
4. Timely Completion of Corrections List - Once the Developer has submitted a written indication that the Corrections List is complete, the Engineering Inspector will inspect the project again in relation to the Corrections List. The Engineering Inspector will provide a written response within 7-days as to whether the corrections list was completed, or whether items were not completed.

H. Payment for Extra Inspections – City inspection fee estimates include only one inspection for each type of inspection. The assumption is that the Developer and Contractor have performed their own inspection based upon the City's inspection forms, that everything is complete, and that it is ready for City inspection. It is not the City's role to provide *'quality control/quality assurance'* for the developer's project, which we feel can be done in one inspection by City staff. Should the inspection require more than one inspection for a

'system' bond reduction/release, the Developer will be charged on an hourly rate basis for the City's additional work effort.

I. Bond Estimate Unit Prices – The City Engineer is responsible for revising the City's bond estimate unit prices on at least a yearly basis (January or every year). The City Engineer may revise the bond estimate unit prices on a more frequent basis in cases where it is deemed necessary.

9.2 PRIVATE DEVELOPMENT PROJECT BONDS - GENERAL

A. There are also, several other different types of bonds used in the construction of private development projects. These bonds are generally described in this section so the Developer understands what each of these bonds are, what they are used for, who administers them, and where to find additional information concerning them. These bonds are:

1. Land disturbance activities and improvements bond
2. Revegetation bond
3. Restoration bond
4. Public improvement bond – landscaping & street lighting
5. Public improvement bond - infrastructure
6. Non-public improvement bond

B. Land Disturbance Activities and Improvements Bond, Revegetation Bond, and Restoration Bond – The Land Disturbance Activities and Improvements Bond, Revegetation Bond, and the Restoration Bond for the City of West Jordan are administered through *'Title 81, Chapter 4 – Bonds'*. Initiation, processing, reductions and releases of these bonds will be administered through this ordinance. The Developer is to be familiar with its particulars as the City will follow the provisions of the ordinance in administering these bonds.

The Engineering Department is responsible for establishing and releasing these three bonds related to land disturbance, grading, erosion control, revegetation, and restoration of areas disturbed as part of private development projects.

C. Public Improvement Bond – Landscaping & Street Lighting – This type of bond is required as its warranty period is different from the typical *'Public Improvement Bond - Infrastructure'* and it allows the *Public Improvement Bond – Infrastructure'* bond to be released more quickly As such, a separate, specific bond agreement is required to address issues specifically related to landscaping and street lighting.

D. Public Improvement Bond - Infrastructure – This type of bond addresses the public improvements required as part of the *'Released for Construction* Drawings', and only those public improvements shown on these drawings.

Public Improvement Bonds for the City of West Jordan are administered through *'Title 89, Chapter 6, Part 12 – Public Improvement Bonds'*. Initiation, processing, reductions and releases of these bonds will be administered through this ordinance. The Developer is to be familiar with its particulars as the City will follow the provisions of the ordinance in administering these bonds.

The Engineering Department is responsible for establishing and releasing the Public Improvement Bond - Infrastructure related to public infrastructure improvements. This includes all of the items listed below, which are associated with public improvements.

1. Earthwork/erosion control
2. Culinary water
3. Secondary/irrigation water
4. Sanitary sewer
5. Storm drainage
6. Street improvements
7. Miscellaneous/finish items

Additional categories may be added if approved by the City Engineer. Reduction requests may be made only once every 30-days and no reduction is to be authorized until such time as the Engineering inspector has inspected the improvements and found them to be in compliance with the City's standards and specifications. Reductions are to be made only as they apply to the completion, satisfactory to the City Engineer, of entire systems.

The Warranty and Final bond reduction/release will be processed once all facilities have been completed, inspected and found to be acceptable by the City Engineer. The City will retain 10-percent of the bond amount plus the estimated cost of a one-inch thick asphalt concrete overlay for the roadways until Final Acceptance by the City Manager following the Warranty Period.

E. Non-public Improvement Bond – This bond is applied to projects where on-site, non-public, landscaping, or common area improvements is required as part of the Municipal Code or is conditioned by the Planning Commission. The Developer is to work with the Engineering Department, Community Development Department, and the City Attorney's Office in determining the amount of the bond. The Engineering Department is responsible for the administration of this bond with cooperation from the Community Development Department, which includes bond preparation, establishment, reductions and releases.

F. Planning Commission and Other Project Conditions – During the project review and approval process, a project may be conditioned to provide specified items as part of the project approval which do not fit into the bond categories indicated above. For instance, the Planning Commission may condition a project to construct a wall or landscaping which are on private property, which is not a common non-public improvement, and is not part of the already prepared *'Released for Construction Drawings'* set of drawings. In this situation, the Community Development Department may withhold the issuing of the *'Certificate of Occupancy'* for the project to ensure the completion of these conditions, or such improvements.

9.3 'RELEASED FOR CONSTRUCTION DRAWINGS'

A. General – These documents are mentioned in this section to indicate that it is from these documents that the bond estimate sheet and bond are to be prepared. Once these drawings are stamped and signed, then a final *'bond estimate sheet'* can be prepared.

B. Preparation and Finalizing – These drawings are initiated as part of a *'site plan'* project or the *'preliminary plat'* phase of a *'subdivision'* and are finalized as part of the *'final'* approval

portions of these projects. The Developer and his/her engineer may submit draft *'bond estimate sheets'* from these preliminary reviews/approvals, however, only the finalized, stamped and signed version of these documents may be used to prepare the final *'bond estimate sheet'*, and subsequent final bond.

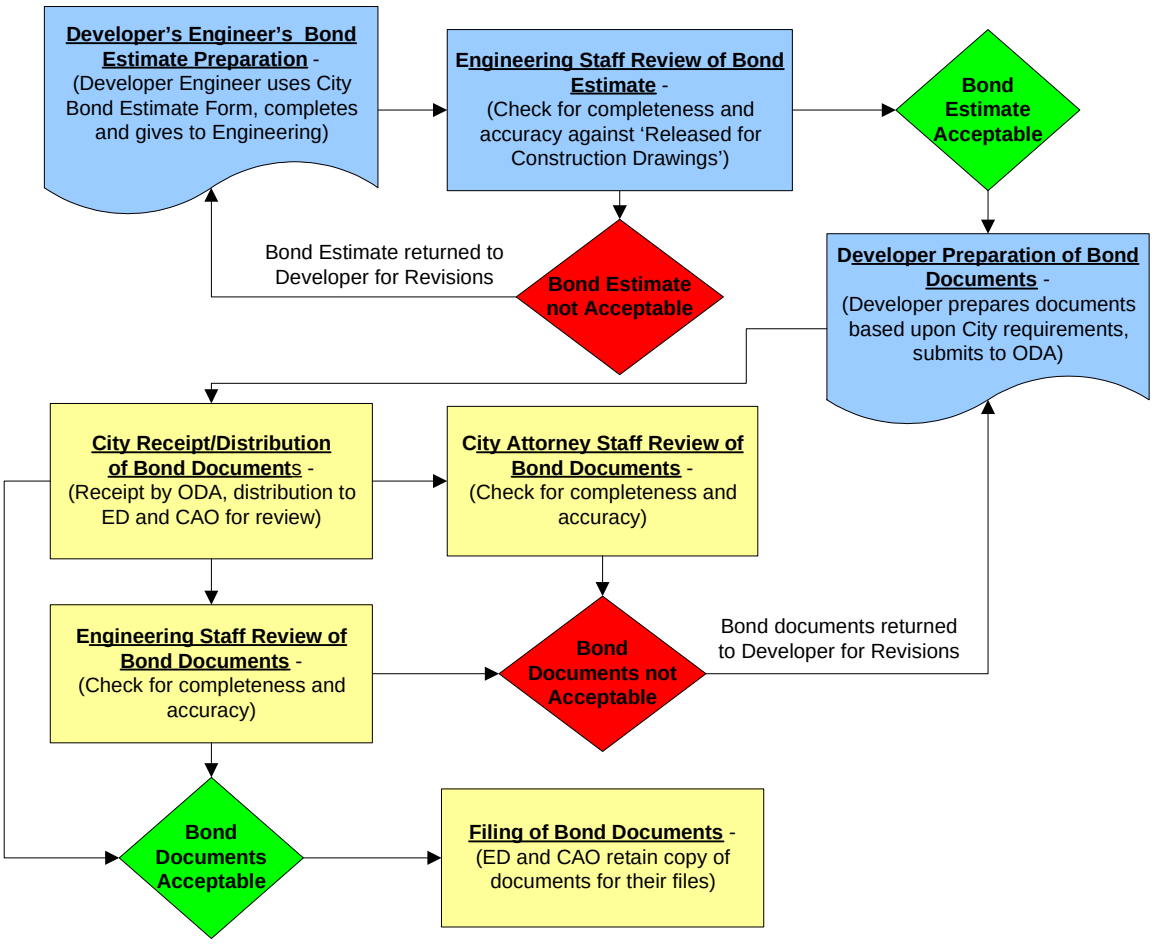
In the case where items are changed during construction, the Developer and his/her engineer/contractor are to submit proposed revised changes, which the City Engineer will then review, approve or deny, and make part of the *'Released for Construction Drawings'*. If the changes are significant enough, the *'bond estimate sheet'* must also be revised, and a new Public Improvement Bond prepared for these revisions.

C. City *'Released for Construction Drawings'* - *'Released for Construction Drawings'* are a specific set of documents which are signed by the City Engineer and other affected City departments and agencies, which define the specific *'public improvements'* which are to be constructed as part of the project. These drawings are the originating documents used for the preparation of the bond estimate sheet and subsequent bond.

9.4 BOND DOCUMENTS PREPARATION AND APPROVAL

A. General – The Developer has primary responsibility for bond document preparation and submission to the City, and the City is responsible for review of these documents to ensure they meet City requirements. Corrections of these documents are the Developer's responsibility as is coordination with his/her staff and/or consultants used in the preparation of these documents. In general, the process is graphically described as follows:

Flowchart 9-02 – Bond Documents Preparation and Approval Process



B. Developer Engineer's Bond Estimate Preparation – The first step in the preparation of the bond documents, is the Developer's preparation of a draft *'bond estimate sheet'*. This is accomplished by obtaining a blank *'bond estimate sheet'* from the City Engineer, and using the finalized *'Released for Construction Drawings'* for the project to prepare a draft *'bond estimate sheet'* for the project. This document is to be stamped and signed by the Developer's engineer and submitted to the City Engineer for his/her review and approval.

C. City Staff Review of Bond Estimate – Once the *'bond estimate sheet'* has been prepared by the Developer's engineer and submitted to the City Engineer, he/she will review the estimate for completeness, comparing it against the *'Released for Construction Drawings'* and will provide a written response to the Developer and his/her engineer. The Developer is responsible for ensuring the necessary corrections are made and the document returned to the City Engineer for approval.

D. Developer Preparation of Bond Documents – Once the *'bond estimate sheet'* is approved by the City Engineer, he will provide a written response of such to the Developer and his/her engineer with copies to the CAO and ODA. The Developer is to work with the CAO in ensuring all CAO requirements are met.

E. Developer Submission of Bond – The Developer and his/her bonding company are to contact the CAO, ensure they understand the CAO's requirements, and then work toward addressing the CAO's requirements. Once the Developer feels the documents meet the CAO's requirements, submit these documents to the CAO for review. If the documents are acceptable, the CAO will notify the Developer of such in writing.

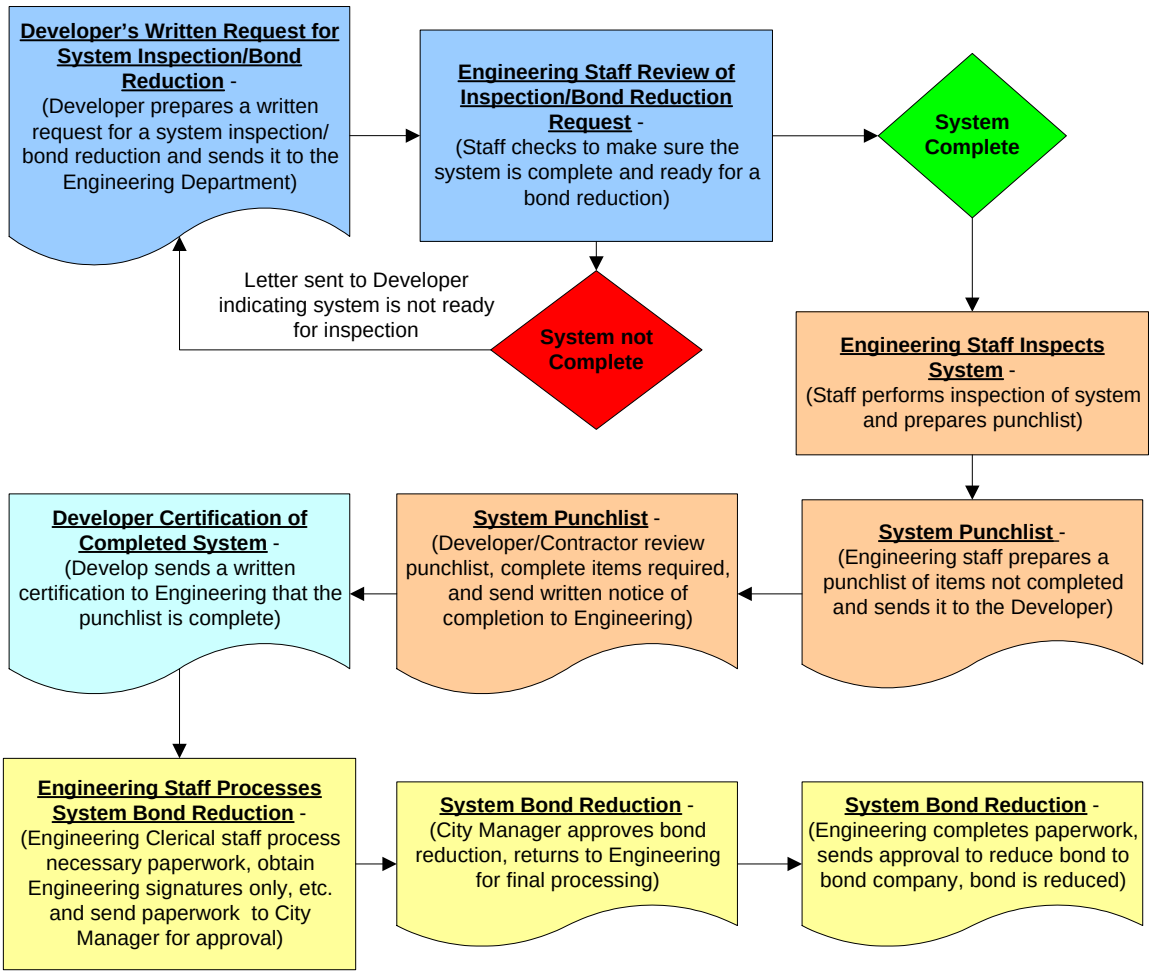
   If the documents are not acceptable, the CAO will also respond in writing to the Developer indicating what still needs to be provided and the ODA will be copied.

F. City Attorney Approval of Bond - Once the CAO is satisfied, it will stamp the documents as approved and send a written response to the Developer of their approval. Once all CAO requirements have been met, final documents will need to be submitted to the CAO and ODA for finalizing and filing with a copy to the ED.

9.5 SYSTEM BOND REDUCTIONS

A. General – The overall philosophy in requiring bond reductions on a *'system-by-system'* basis is ensure the quality of the end product and speed up the acceptance process. By doing this, the City can better ensure that each system, is complete and ready to be put into service, that fewer major fixes will be required at the end of the project, and that by requiring each *'system'* to be complete, that the Warranty Inspection and Final Inspections will be quicker and easier to accomplish, thereby saving. In general, the process is graphically described as follows:

Flowchart 9-03 – System Bond Reduction Process



B. Developer Written Request for System Inspection/Bond Reduction

1. General – The Developer is to provide the Engineering Department with a written request for a bond reduction/release and a certification that the *'system'* work is ready for inspection and reduction/release. A City form has been prepared for this purpose.

   The written request and certification sets the basis for the City inspecting the work, and ensures the Developer/his/her contractor understand what work must be completed and to what level this work must be completed in order to receive a bond reduction/release. It also ensures the City has *'systems'* which are ready to inspect, and results in a quicker reduction in bond proceeds.

   In the past, the City has reduced bond amounts based upon overall general completion of the project resulting a lot of work being delayed until the end of the project, and in not having completed *'systems'* until the very end of the project. This results in a number of difficulties in reducing or releasing bonds and completing items necessary to complete the Corrections List.

2. Developer written request – The Developer and his/her contractor are required to submit a written request for bond reduction/release along with a *'certification form'* for each *'system'* the Developer wishes to have a bond reduced/released. These forms are including in Appendix AA of the Development Processing Manual. The Developer and Contractor are to review the form and all of its provisions, sign and date the form certifying the *'system'* is ready for a bond reduction.
3. City staff review of request – City inspection staff will review the written request and certification and respond in writing to the Developer if the project is not ready for an inspection. If the request and certification are in order, the Engineering Inspector will complete the inspection.
4. City action – Once a completed *'certification form'* is received by the Engineering Department; the Engineering Inspector will schedule the project for an inspection.

C. City Staff Review of System Inspection/Bond Reduction Request

1. General – Once the Engineering Department has received a written request for a *'system'* bond reduction, Engineering inspection staff will review the request and project to ensure the project/system, is worthy of an inspection. If it is, an inspection will be performed. If it is not, the Developer and Contractor will be notified they have not sufficiently completed the project/system to allow an inspection to be completed.

D. System Inspection and Punchlist Preparation

1. General – Once it is determined the project/system is complete enough to inspect, an inspection will be performed, a punchlist prepared, and the punchlist will be sent to the Developer and Contractor.
2. Inspection checklists – City staff will be using the checklists contained in Appendices C, D, and E of the *'Private Development Construction Inspection Manual'* for inspection of the project. The Developer is required to have gone through these same checklists, and ensured each of the items is complete, prior to requesting a system release for that particular system.
3. Inspection of project – The Engineering inspection staff will use the *'system'* inspection checklist required, and will use it to inspect the *'system'* being requested to be released. If it appears the Developer and Contractor have not reviewed the checklist because there are so many items not completed, the Developer and Contractor will be notified of such. If the *'system'* is worthy of an inspection, then the inspection will be performed and a punchlist prepared.
4. Preparation and transmission of punchlist – Typically the Engineering Inspector and the Engineering Inspection Supervisor will be involved in the inspection. The inspection will be performed; a punchlist of uncompleted items prepared, and each person will sign the inspection form.

E. Developer Punchlist Corrections

1. General – The Developer/Contractor are required to complete all of the items indicated on the system/project punchlist and then notify the Engineering Department in writing through the use of the proper certification form, that the work is complete.
2. Developer completion of punchlist items – Once the punchlist has been prepared and sent to the Developer and Contractor, they are required to complete the items indicated on the punchlist. If there are questions regarding any items on the punchlist, please contact the

Engineering Inspector for additional information. The punchlist has a life of 30 calendar days. If items listed on the punchlist are not completed within the 30-day time period, the system/project will need to be reinspected and a new punchlist prepared, which will also have a life of 30-days. One inspection is included in the *'inspection fee'* and therefore, any inspections beyond the first inspection, must be paid for by the Developer in addition to the original inspection fee.

3. Developer Certificate of Completion – Once the Developer/Contractor have completed the City's inspection punchlist, the Developer is to certify the completion by the use of the forms contained in Appendix AA of the DPM. These forms are to be signed and dated, and then forward to the Engineering Department for processing.

F. Bond Reduction Processing

1. Certification of completion for system/project – Once the Engineering Department has received the Developer's/Contractor's certification that the punchlist has been completed, the Engineering inspection staff will reinspect the project and certify all items have been completed. If all items are complete, the Engineering Inspection Supervisor will forward his approval to the Engineering clerical staff for bond reduction processing.
2. Engineering clerical staff preparation of paperwork – With the receipt of certification from the Engineering inspection staff that the system/project is ready; the Engineering clerical staff will initiate the processing of the paperwork necessary to reduce the bond. This will require that the Engineering Inspector, Engineering Inspection Supervisor, and the City Engineer sign the form so the reduction can be processed.
3. Approvals by Engineering staff only – Bond reductions will require only the signatures of the Engineering Inspector, Engineering Inspection Supervisor, and the City Engineer for processing. Once the project reaches the Warranty Inspection, and Final Inspection stage, then other departments will be involved to ensure their concerns are also addressed. This is done in order to reduce the amount of time required to finalize a bond reduction.
4. Approval by City Manager – Once all items have been completed on the *'system'* bond reduction process applications and forms and have been reviewed by the City Engineer, and then the *'system'* bond reduction process documents are ready to be submitted to the City Manager for approval. If the documents are signed and approved by the City Manager, the Administrative Assistant will then copy the documents and distribute them to the Developer.

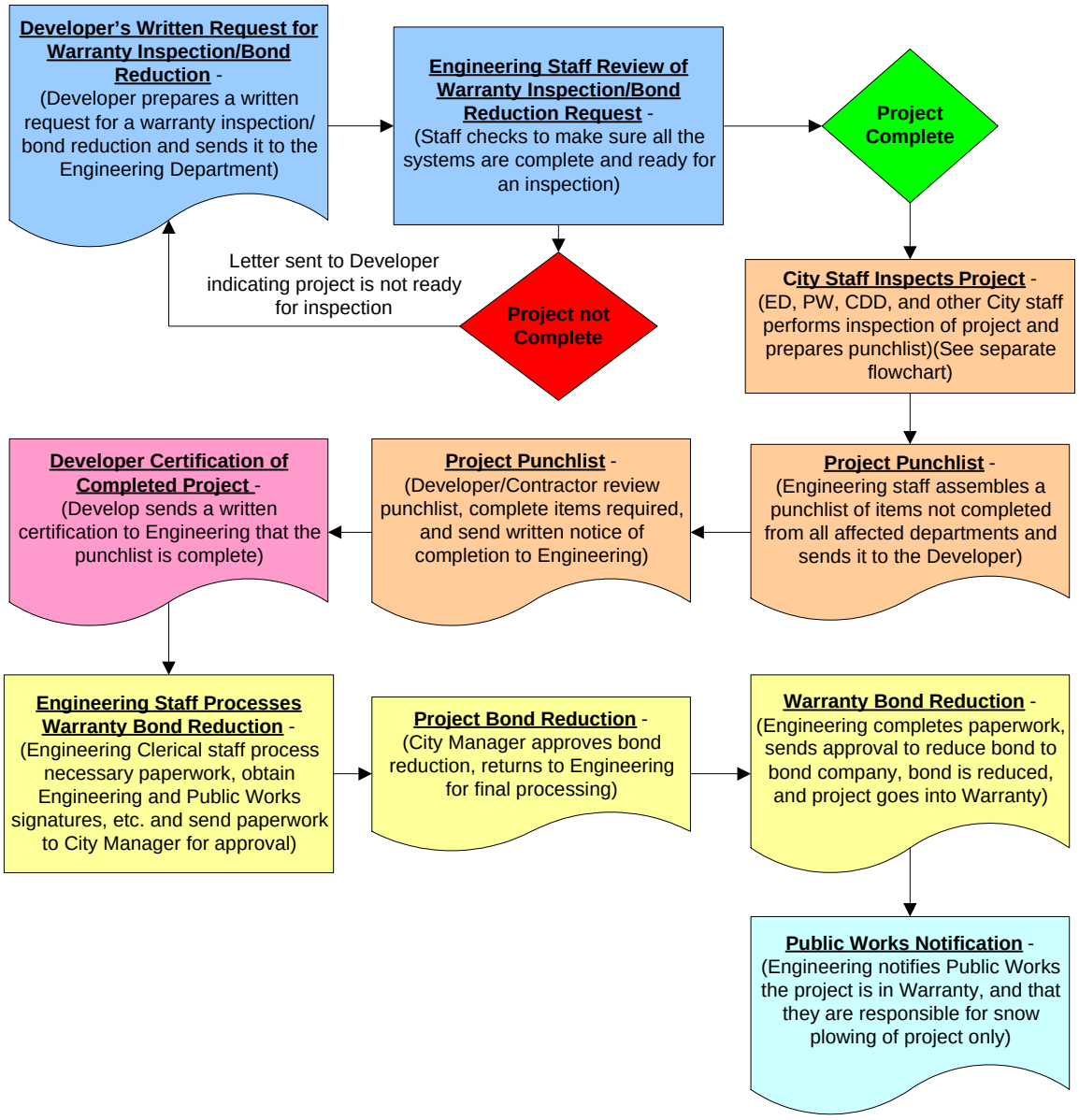
16.6 WARRANTY INSPECTION/BOND REDUCTION

A. General – The overall philosophy in requiring a Warranty Inspection is to set the time at which the Developer/Contractor and City agree the project is complete, and the Warranty Period can begin. It assumes that an inspection of the entire project will be performed, a punchlist prepared and given to the Developer/Contractor, and that the punchlist is completed. Once it is agreed that the punchlist is completed, then the Warranty Period can begin. In addition to the descriptions contained in this Manual, also please refer to the PDCIM, *'Section 5.0 – Warranty Inspection/Acceptance Requirements'* for additional details regarding this process.

As is described in the Ordinance, bond proceeds will be reduced on a *'system-by-system'* basis, and at the most, once monthly. Once all items under a given *'system'* description have been constructed, inspected and deemed completed by the Engineering Inspector, a written

request from the Developer will initiate the processing of the necessary bond reduction. This will result in a 75-percent total reduction in the bond amount for each system prior to the beginning of the Warranty Period, minus the *'Finish Items'* portion of the bond. Once the Warranty Inspection has been completed, all Corrections List items completed and verified by the Engineering Inspector, the remaining *'systems'* amounts plus the 90-percent of the *'Miscellaneous Items'* portion of the bond will be released at this time. At the end of the Warranty Period, the remaining 10-percent of the *'Public Improvement Bond - Infrastructure'* will be released. The *'Public Improvement Bond – Landscaping & Street Lighting'* which has a longer warranty period will not be released until its requirements have been met. In general, the process is graphically described as follows:

Flowchart 9-04 Warranty Inspection/Bond Reduction Process



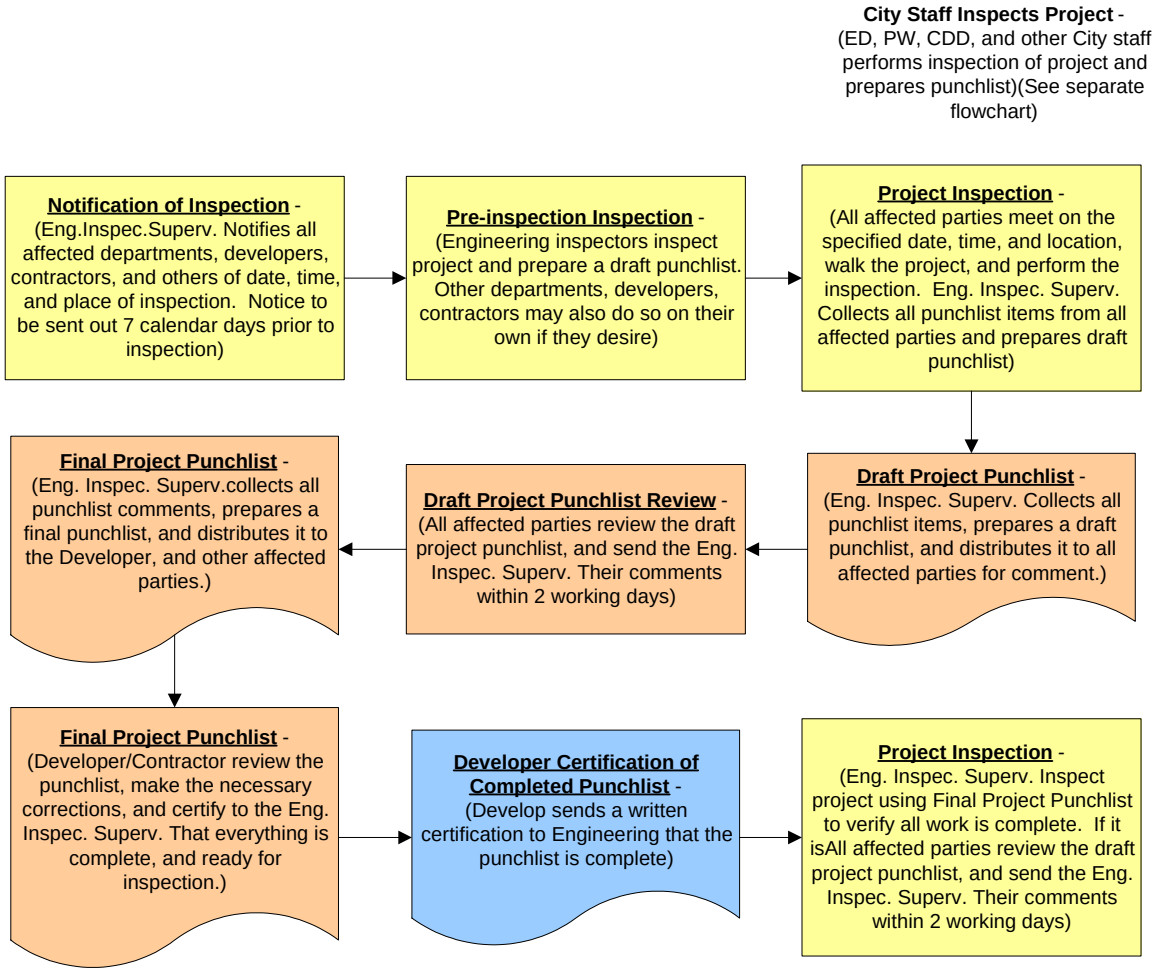
B. Developer Application for Warranty Inspection

1. General – The Developer needs to provide the Engineering Department with a written request for a Warranty Inspection and a certification that the *'project'* work is ready for inspection and reduction/release. The written request and certification sets the basis for the City inspecting the work, and ensures the Developer/his/her contractor understands what work is to be completed and to what level this work needs to be completed in order to receive a Warranty Inspection. It also ensures the City has a project which is ready to inspect, and results in a quicker inspection, putting the project into the Warranty period, and reduction in bond proceeds.
2. Developer written request – The Developer and his/her contractor are to submit a written request for Warranty Inspection along with a *'certification form'* for each the *'project'*. These forms are included in Appendix F of the Private Development Construction Inspection Manual. The Developer and Contractor are to review the form and all of its provisions, sign and date the form certifying the *'project'* is ready for a Warranty Inspection.
3. City staff review of request – City inspection staff will review the written request and certification and respond in writing to the Developer if the project is not ready for a Warranty Inspection. If the request and certification are in order, the Engineering Inspector will schedule a time for inspection of the project.
4. City action – Once a completed *'certification form'* is received by the Engineering Department; the Engineering Inspector will schedule the project for an inspection.

C. Project Inspection and Punchlist Preparation

1. General – Once it is determined the project/system is complete enough to inspect, an inspection will be performed, a punchlist prepared, and the punchlist will be sent to the Developer and Contractor. In general, the process is graphically described as follows:

Flowchart 9-05 Warranty and Final Inspection/Punchlist Preparation



2. Inspection checklists – Inspection checklists – City staff will be using the checklists contained in Appendices C, D, and E of the Private Development Construction Inspection Manual for inspection of the project. The Developer is to have gone through these same checklists, and ensured each of the items is complete, prior to requesting a system release for that particular system.
3. Inspection of project – The Engineering inspection staff will use the *'system'* inspection checklist required, and will use it to inspect the *'system'* being requested to be released. If it appears the Developer and Contractor have not reviewed the checklist because there are so many items not completed, the Developer and Contractor will be notified of such. If the *'system'* is worthy of an inspection, then the inspection will be performed and a punchlist prepared.
4. Preparation and transmission of punchlist – Typically the Engineering Inspector and the Engineering Inspection Supervisor will be involved in the inspection. The inspection will be performed; a punchlist of uncompleted items prepared, and each person will sign the inspection form.

D. Developer Punchlist Corrections

1. General – The Developer/Contractor is to complete all of the items indicated on the project punchlist and then notify the Engineering Department in writing through the use of the proper certification form, that the work is complete.
2. Developer completion of punchlist items – Once the punchlist has been prepared and sent to the Developer and Contractor, they are to complete the items indicated on the punchlist. If there are questions regarding any items on the punchlist, please contact the Engineering Inspector for additional information. The punchlist has a life of 30-calendar days. If items listed on the punchlist are not completed within the 30-day time period, the project will need to be reinspected and a new punchlist completed, which will also have a life of 30-days. One inspection is included in the *'inspection fee'* and therefore, any inspections beyond the first inspection, must be paid for by the Developer in addition to the original inspection fee.
3. Developer Certificate of Completion – Once the Developer/Contractor have completed the City's inspection punchlist, the Developer is to certify the completion by the use of the forms contained in Appendix AA of the DPM. These forms must be signed and dated, and then forward to the Engineering Department for processing.

E. Warranty Bond Reductions Processing

1. Certification of completion for project – Once the Engineering Department has received the Developer's/Contractor's certification that the punchlist has been completed, the Engineering inspection staff will reinspect the project and certify all items have been completed. If all items are complete, the Engineering Inspection Supervisor will forward his approval to the Engineering clerical staff for Warranty inspection/bond reduction processing.
2. Engineering clerical staff preparation of paperwork – With the receipt of certification from the Engineering inspection staff that the project is ready, the Engineering clerical staff will initiate the processing of the paperwork necessary to put the project into the Warranty Period, and reduce the bond. This will require that the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and Public Works Department Director sign the form so the reduction can be processed.
3. Approvals by Engineering and Public Works departments staff – Bond reductions will require only the signatures of the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and the Public Works Department for processing. Community Development Department concerns have already been addressed by either a separate bond, which they will administer, or through inclusion of their issues in the Public Improvement Bond, which will be inspected and processed by the Engineering Department. This is done in order to reduce the amount of time required to finalize a bond reduction.
4. Approval by City Manager – Once all items have been completed on the 'warranty' bond reduction process applications and forms and have been reviewed by the City Engineer, and then the 'warranty' bond reduction process documents are ready to be submitted to the City Manager for approval. If the documents are signed and approved by the City Manager, the Administrative Assistant will then copy the documents and distribute them to the Developer.

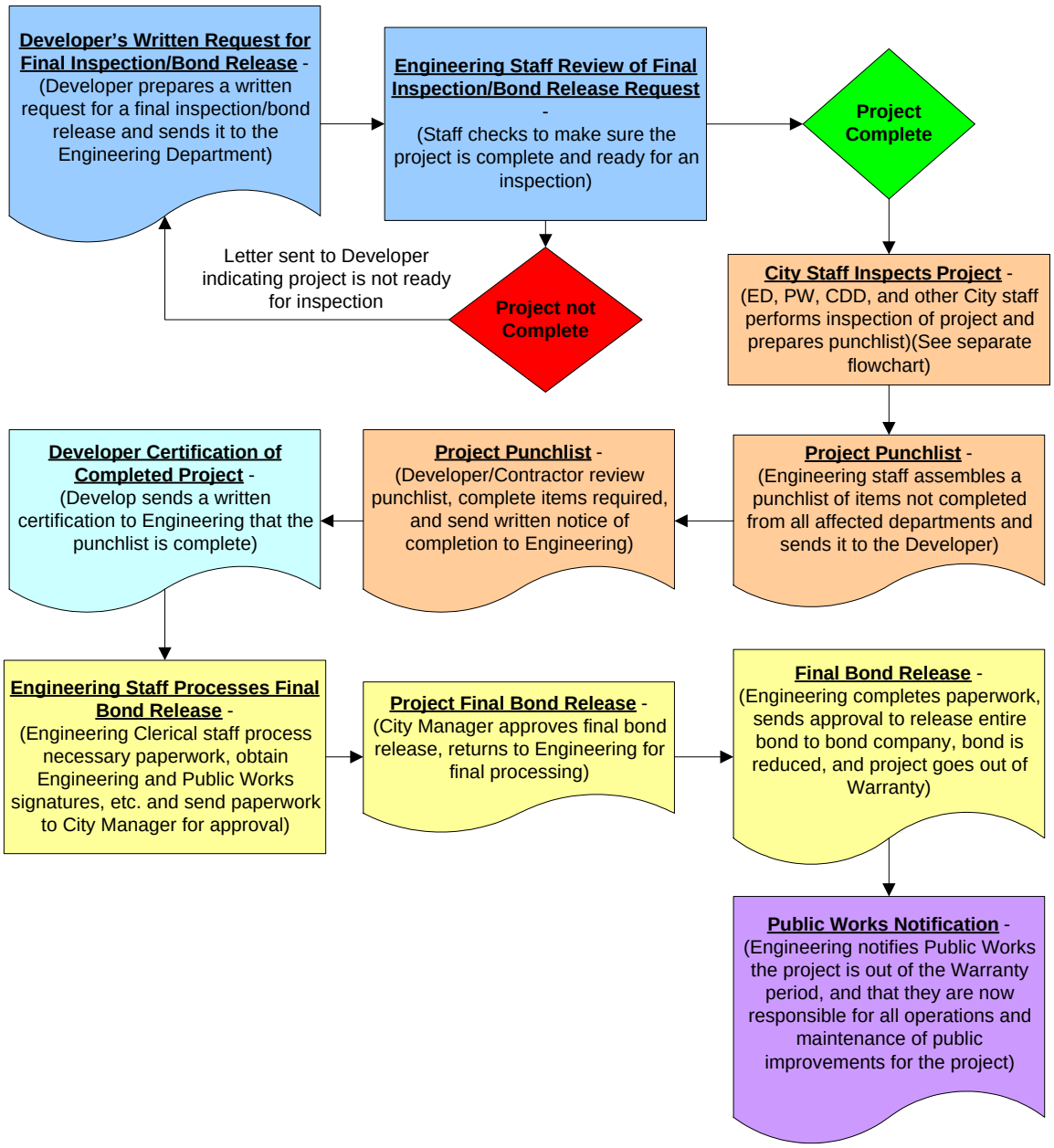
F. Public Works Department Notification

1. Engineering staff notifies Public Works they are responsible for now snow plowing for the project – Once the Warranty Inspection/bond reduction has been fully processed and approved by the City Manager, the City Engineer will notify the Public Works Department of such and inform them they are responsible for snow plowing operations of the project only. All other maintenance activities are still the responsibility of the Developer until the Warranty Period is complete, and the project accepted by the City.

16.7 FINAL INSPECTION/BOND RELEASE

A. General – The overall philosophy in requiring a Final Inspection is to set the time at which the Developer/Contractor and City agree the project is complete, and the Warranty Period is complete, and the City is responsible for taking over the complete operations and maintenance of the public infrastructure. It assumes that an inspection of the entire project at the end of the Warranty Period will be performed, a punchlist prepared and given to the Developer/Contractor, and that the punchlist is completed. Once it is agreed that the punchlist is completed, then the Warranty Period is complete and the City assumes operation and maintenance activities. In general, the process is graphically described as follows:

Flowchart 9-06 Final Inspection Bond Release Process



B. Developer Application for Final Inspection

1. General – The Developer is to provide the Engineering Department with a written request for a Final Inspection and a certification that the *'project'* work is ready for inspection and release.

   The written request and certification sets the basis for the City inspecting the work, and ensures the Developer/his/her contractor understand what work must be completed and to what level this work must be completed in order to receive a Final Inspection. It also

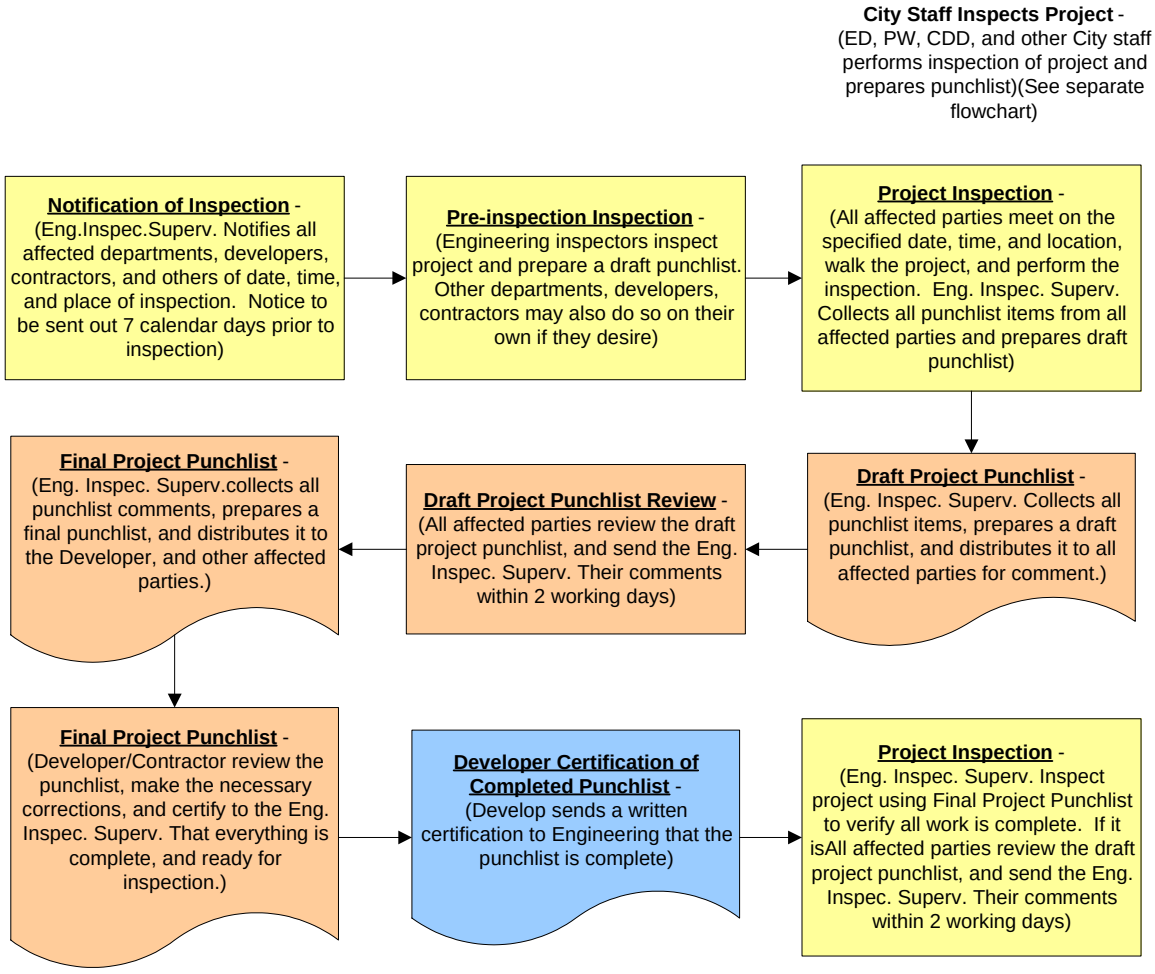
ensures the City has a project which is ready to inspect, and results in a quicker inspection, taking the project out of the Warranty period, and release of the bond.

2. Developer written request – The Developer and his/her contractor are required to submit a written request for Final Inspection along with a *'certification form'* for each the *'project'*. These forms are included in Appendix F of the Private Development Construction Inspection Manual. The Developer and Contractor are to review the form and all of its provisions, sign and date the form certifying the *'project'* is ready for a Final Inspection.
3. City staff review of request – City inspection staff will review the written request and certification and respond in writing to the Developer if the project is not ready for a Final Inspection. If the request and certification are in order, the Engineering Inspector will schedule a time for inspection of the project.
4. City action – Once a completed *'certification form'* is received by the Engineering Department; the Engineering Inspector will schedule the project for an inspection.

C. Project Inspection and Punchlist Preparation

1. General – Once it is determined the project is complete enough to inspect, an inspection will be performed, a punchlist prepared, and the punchlist will be sent to the Developer and Contractor. In general, the process is graphically described as follows:

Flowchart 9-05 Warranty and Final Inspection/Punchlist Preparation



2. Inspection checklists – Inspection checklists – City staff will be using the checklists contained in Appendices C, D, and E of the *'Private Development Construction Inspection Manual'* for inspection of the project. The Developer is required to have gone through these same checklists, and ensured each of the items is complete, prior to requesting a system release for that particular system.
3. Inspection of project – The Engineering inspection staff will use the *'system'* inspection checklist required, and will use it to inspect the *'system'* being requested to be released. If it appears the Developer and Contractor have not reviewed the checklist because there are so many items not completed, the Developer and Contractor will be notified of such. If the *'system'* is worthy of an inspection, then the inspection will be performed and a punchlist prepared.
4. Preparation and transmission of punchlist – Typically the Engineering Inspector and the Engineering Inspection Supervisor will be involved in the inspection. The inspection will be performed; a punchlist of uncompleted items prepared, and each person will sign the inspection form.

D. Developer Punchlist Corrections

1. General – The Developer/Contractor are required to complete all of the items indicated on the project punchlist and then notify the Engineering Department in writing through the use of the proper certification form, that the work is complete.
2. Developer completion of punchlist items – Once the punchlist has been prepared and sent to the Developer and Contractor, they are required to complete the items indicated on the punchlist. If there are questions regarding any items on the punchlist, please contact the Engineering Inspector for additional information. The punchlist has a life of 30-calendar days. If items listed on the punchlist are not completed within the 30-day time period, the project will need to be reinspected and a new punchlist completed, which will also have a life of 30-days. One inspection is included in the *'inspection fee'* and therefore, any inspections beyond the first inspection, must be paid for by the Developer in addition to the original inspection fee. This will be done on an hourly rate basis of those involved in the inspection, or preparation of paperwork, in any way.
3. Developer Certificate of Completion – Once the Developer/Contractor have completed the City's inspection punchlist, the Developer must certify the completion by the use of the forms contained in Appendix AA of the DPM. These forms must be properly signed and dated, and then forward to the Engineering Department for processing.

E. Final Bond Release Processing

1. Certification of completion for project – Once the Engineering Department has received the Developer's/Contractor's certification that the punchlist has been completed, the Engineering inspection staff will reinspect the project and certify all items have been completed. If all items are complete, the Engineering Inspection Supervisor will forward his approval to the Engineering clerical staff for Final inspection/bond release processing.
2. Engineering clerical staff preparation of paperwork – With the receipt of certification from the Engineering inspection staff that the project is ready, the Engineering clerical staff will initiate the processing of the paperwork necessary to take the project out of the Warranty Period, and release the bond. This will require that the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and Public Works Department Director sign the form so the reduction can be processed.
3. Approvals by Engineering and Public Works departments staff – Bond releases will require only the signatures of the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and the Public Works Department for processing. Community Development Department concerns have already been addressed by either a separate bond, which they will administer, or through inclusion of their issues in the Public Improvement Bond, which will be inspected and processed by the Engineering Department. This is done in order to reduce the amount of time required to finalize a bond reduction.
4. Approval by City Manager – Once all items have been completed on the 'final' bond reduction process applications and forms and have been reviewed by the City Engineer, and then the 'final' bond reduction process documents are ready to be submitted to the City Manager for approval. If the documents are signed and approved by the City Manager, the Administrative Assistant will then copy the documents and distribute them to the Developer, the developer's bonding company, and others as noted on the documents.

F. Public Works Department Notification

1. Engineering staff notifies Public Works they are responsible for all operations and maintenance for the project – Once the Final Inspection/bond release have been fully processed and approved by the City Manager, the City Engineer will notify the Public Works Department of such and inform them they are responsible for all operations and maintenance of the project.

   A more complete description of the transition to the Public Works Department is described in the PDCIM, *'Section 6.10 – Public Works Department Assumption of Maintenance Responsibilities'*.

9.8 ACCEPTANCE BY CITY

A. General – The *'project'* will not be accepted by the City until all of the City's requirements have been met. Acceptance requirements are fully described in *'Section 6.0 – Final Inspection, Acceptance Requirements'* of the PDCIM.

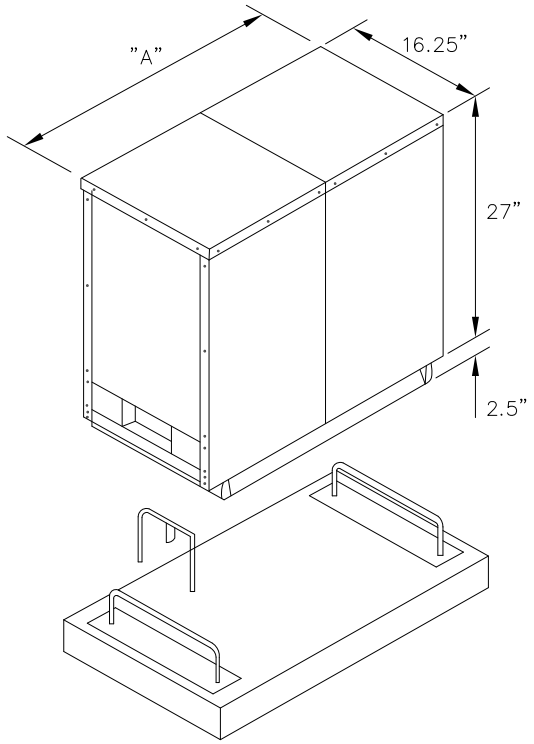
****

APPENDIX A

STANDARD DRAWINGS FOR LANDSCAPE & IRRIGATION

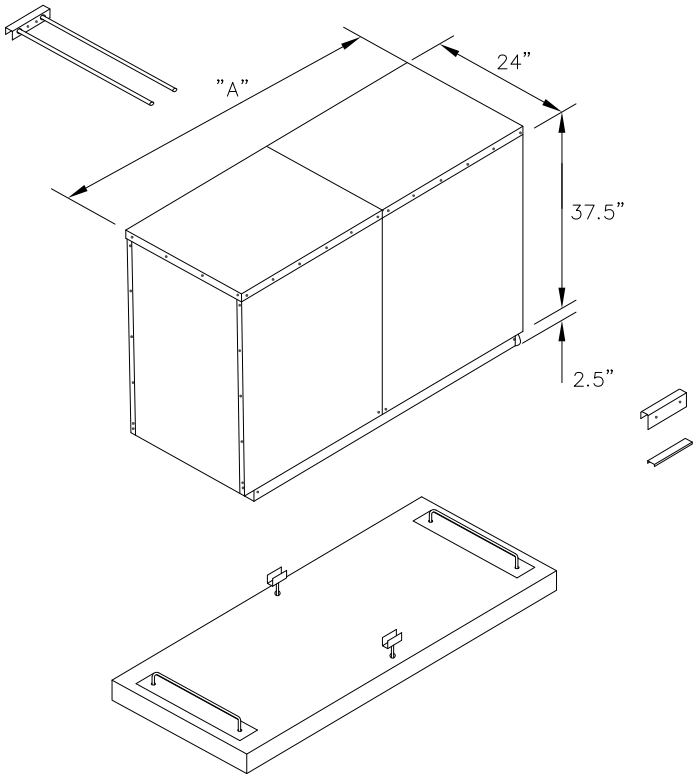
Stand. Dwg. No.	Description
Backflow	
PK-05	Insulated Backflow Enclosures
Curbing	
PK-10	Curbing
Design or Cross-sections	
PK-15	Typical Streetscape Head Pattern
PK-20	Streetscape Planting Cross Section
PK-25	Parkstrip "A"
PK-30	Parkstrip, Alternative 'A-1', 0% Turfgrass
PK-35	Parkstrip "B"
PK-40	Parkstrip "C"
Irrigation	
PK-45	Ped. Mount Controller
PK-50	Mainline Connection No. 2
PK-55	Valve Assembly
PK-60	Valve Assembly
PK-65	Sleeving
PK-70	Spray Pop-up
PK-75	Rotor Pop-up Sprinkler (3504 with Swing Pipe)
PK-80	Rotor Pop-up Sprinkler
PK-85	Pressure Compensating Full-circle Bubbler
PK-90	Xeri-Bubbler on ¼" Tubing
PK-95	Emitters around Plant (on ¼-inch Tubing)
PK-100	Easy Fit Compression Fittings
Plant Material	
PK-105	Tree Planting & Staking
PK-110	Tree Planting & Staking
PK-115	Shrub Planting & Staking
PK-120	60" Square Style "STA" Tree Grate (Framing)
PK-125	Tree Grate Frames (Framing)
PK-130	Tree Grate Frames (Framing)
PK-135	Tree Grate Frames (Framing)
PK-140	Tree Grate Frames (Framing)
Trails	
PK-145	Trail Cross Section
PK-150	1" Control Zone Kit W/ Pressure Regulating Backflow Filter
PK-155	Pressure Reducer Back Flow Preventer

	"A" LENGTH	HEIGHT	WIDTH
SBBC-15ALI	15"	29.5"	16.25
SBBC-30ALI	30"	29.5"	16.25
SBBC-45ALI	45"	29.5"	16.25
SBBC-60ALI	60"	29.5"	16.25



LOW PROFILE INSULATED ENCLOSURE

	"A" LENGTH	HEIGHT	WIDTH
SBBC-40ALHPI	40"	39"	24"
SBBC-60ALHPI	60"	39"	24"
SBBC-75ALHPI	75"	39"	24"
SBBC-90ALHPI	90"	39"	24"



NOTE:

SEE STRONG BOX
MANUFACTURE OR EQUAL

HIGH PROFILE INSULATED TWO PIECE ENCLOSURE

DRAWING DATE MARCH 25, 2009

INSULATED BACKFLOW ENCLOSURES

PLAN
PK-005

975XL/XLSE

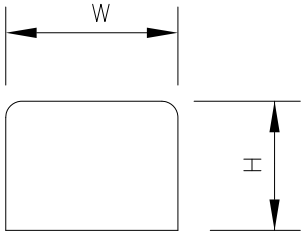
MODEL	SIZE	DEVICE LENGTH	NIPPLE LENGTH	NIPPLE TOTAL	ELBOW TOTAL	TOTAL INCHES	ALUMINUM MODEL NO.	SMOOTH TOUCH MODEL NO.	EXPANDED METAL MODEL NO.
3/4"	12.000	20.250	3"	5.000	4.000	21.000	SBBC-30AL	SBBC-30SS & CR	BC-30CR
1"	13.000	20.250	3"	5.000	5.000	23.000	SBBC-30AL	SBBC-30SS & CR	BC-30CR
1 1/4"	17.000	23.625	3"	5.000	5.500	27.500	SBBC-45AL	SBBC-45SS & CR	BC-45CR
1 1/2"	17.500	23.625	3"	5.000	6.000	28.500	SBBC-45AL	SBBC-45SS & CR	BC-45CR
2"	18.625	23.625	3"	5.000	7.500	31.125	SBBC-45AL	SBBC-45SS & CR	BC-45CR

DRAWING DATE MARCH 25, 2009

INSULATED BACKFLOW ENCLOSURES

PLAN

PK-005



STANDARD CURB STYLE

TYPE	6"x8"	6"x6" SQUARE	6"	5"
WIDTH	8"	6"	6"	5"
H	6"	6"	6"	4"
R	.075"	.075"	4"	4"

DRAWING DATE MARCH 25, 2009

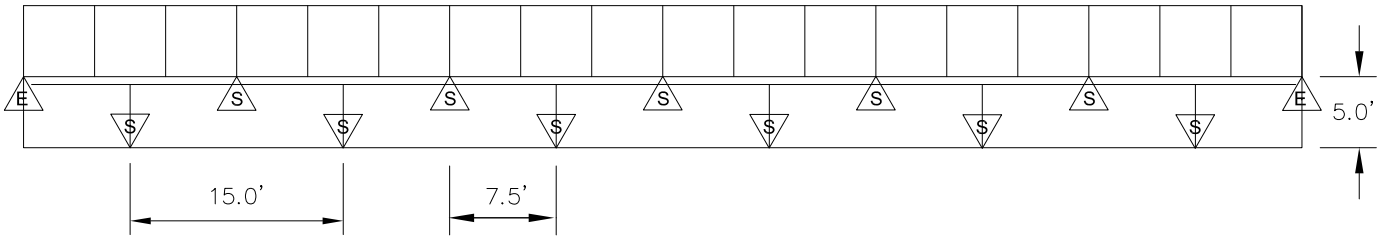
City of West Jordan, Utah

CURBING

PLAN
PK-010

E NEW HUNTER OR RAINBIRD EST-PC POP-UP SPRAY HEAD

S NEW HUNTER OR RAINBIRD SST-PC POP-UP SPRAY HEAD



Notes:

1. HEADS ALTERNATING TO FORM TRIANGLE SPACEING
2. DRAWING NOT TO SCALE
3. MAIN LINE AND LATERIALS ARE TO BE LOCATED ON SIDEWALK SIDE OF PARKSTRIP

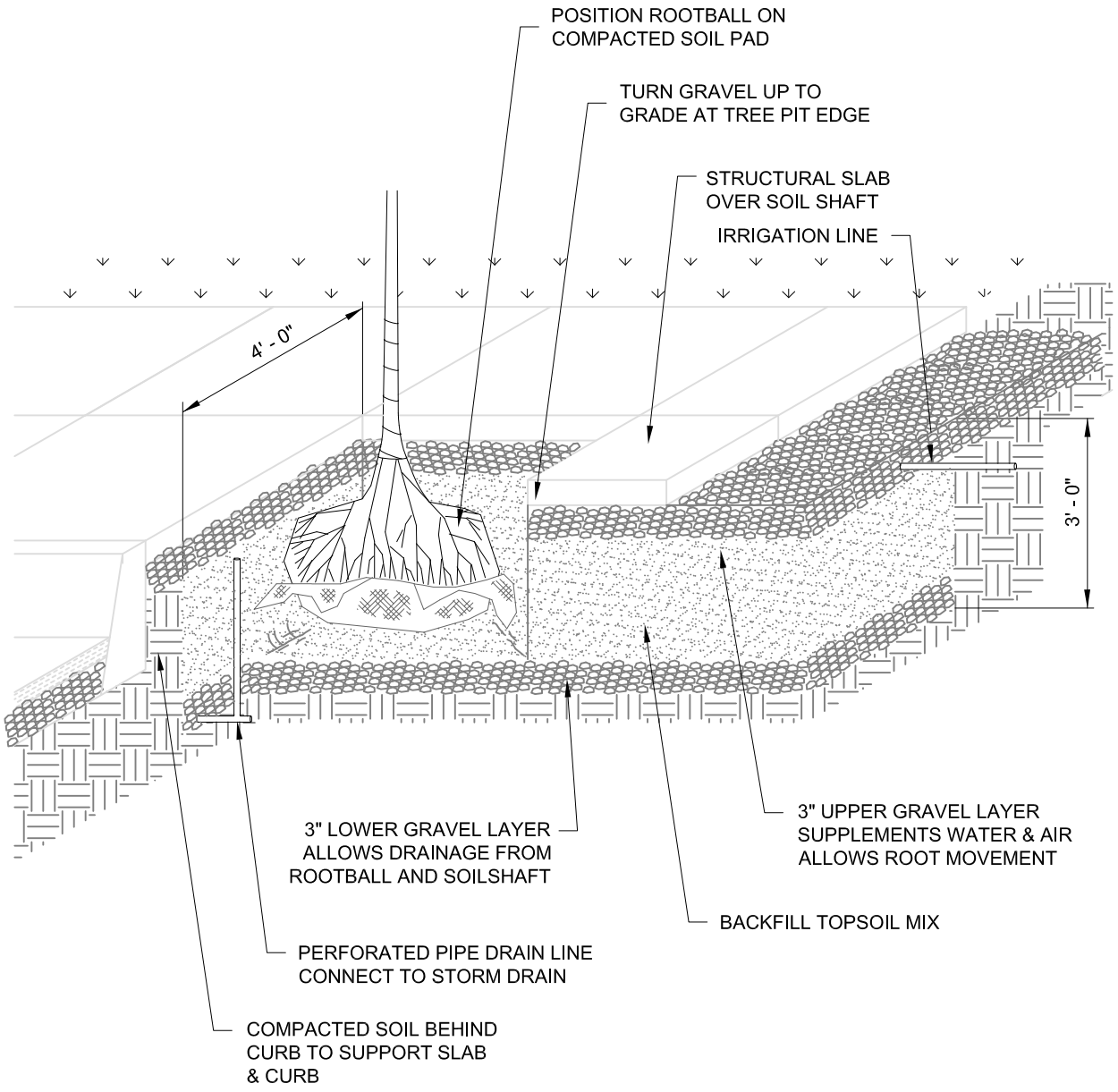
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

TYPICAL STREETSCAPE HEAD PATTERN

PLAN

PK-015

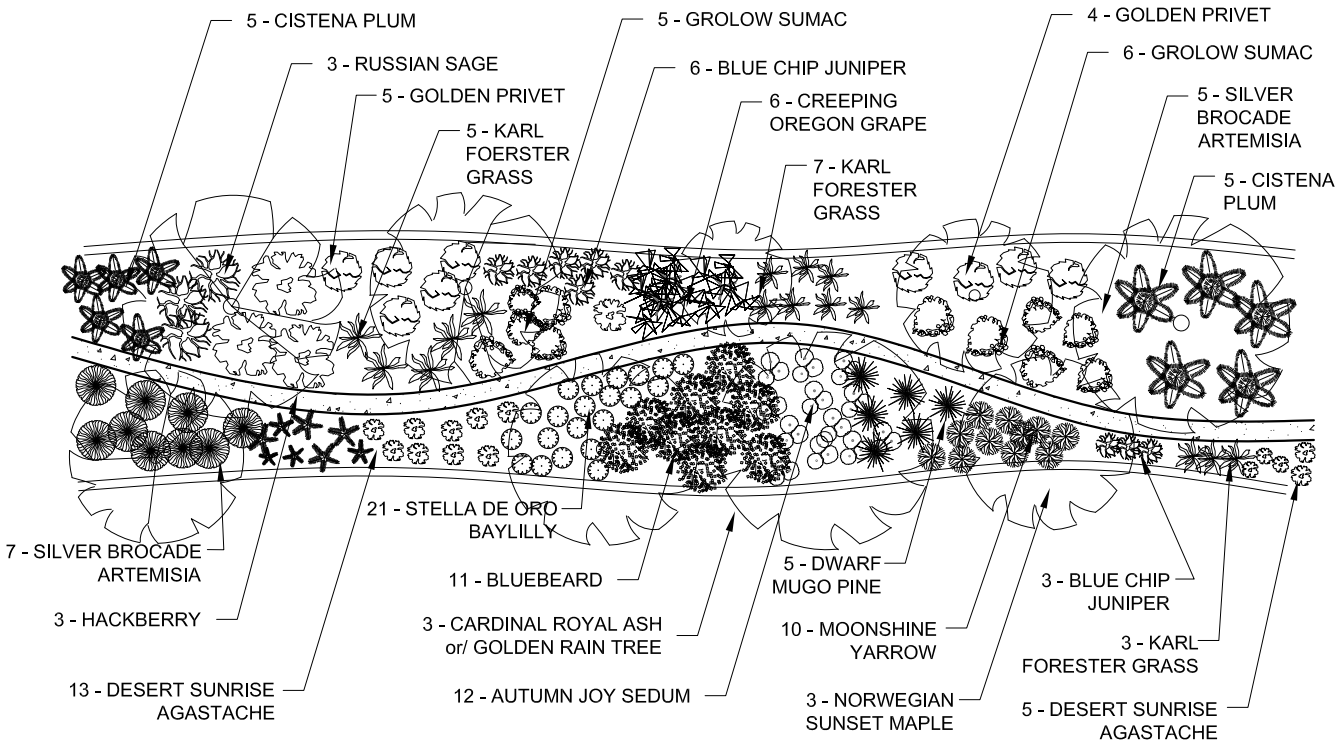


DRAWING DATE MARCH 25, 2009

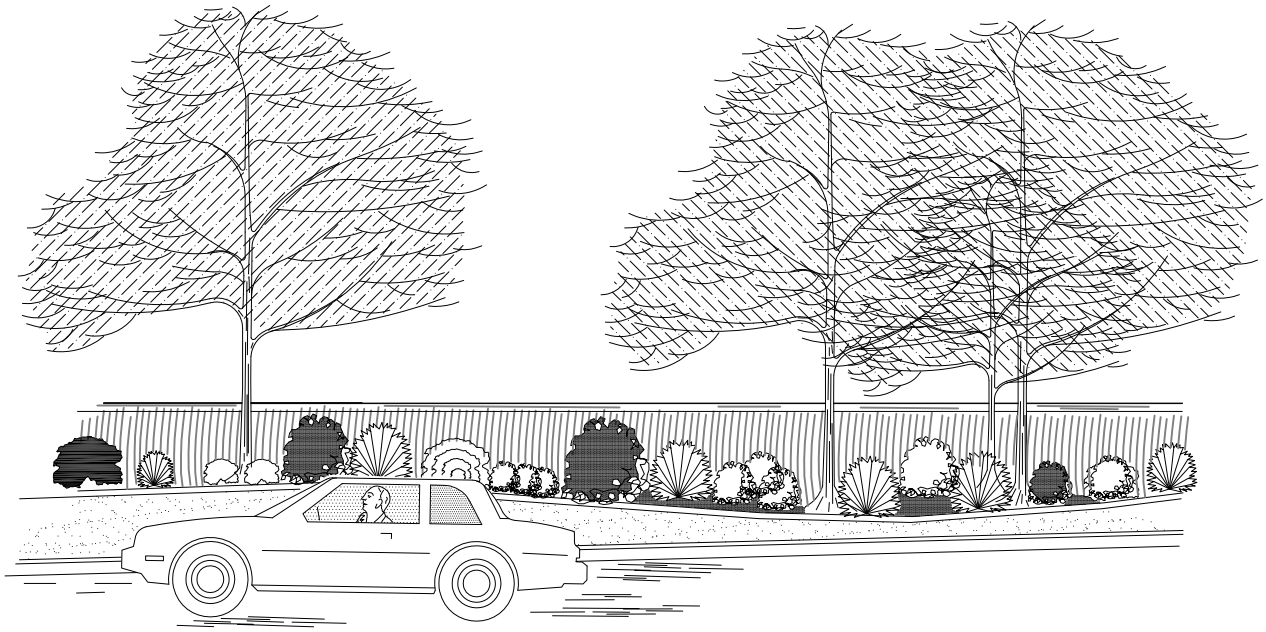
City of West Jordan, Utah

STREETSCAPE PLANTING CROSS SECTION

PLAN
PK-020



NOTE: WEED FABRIC



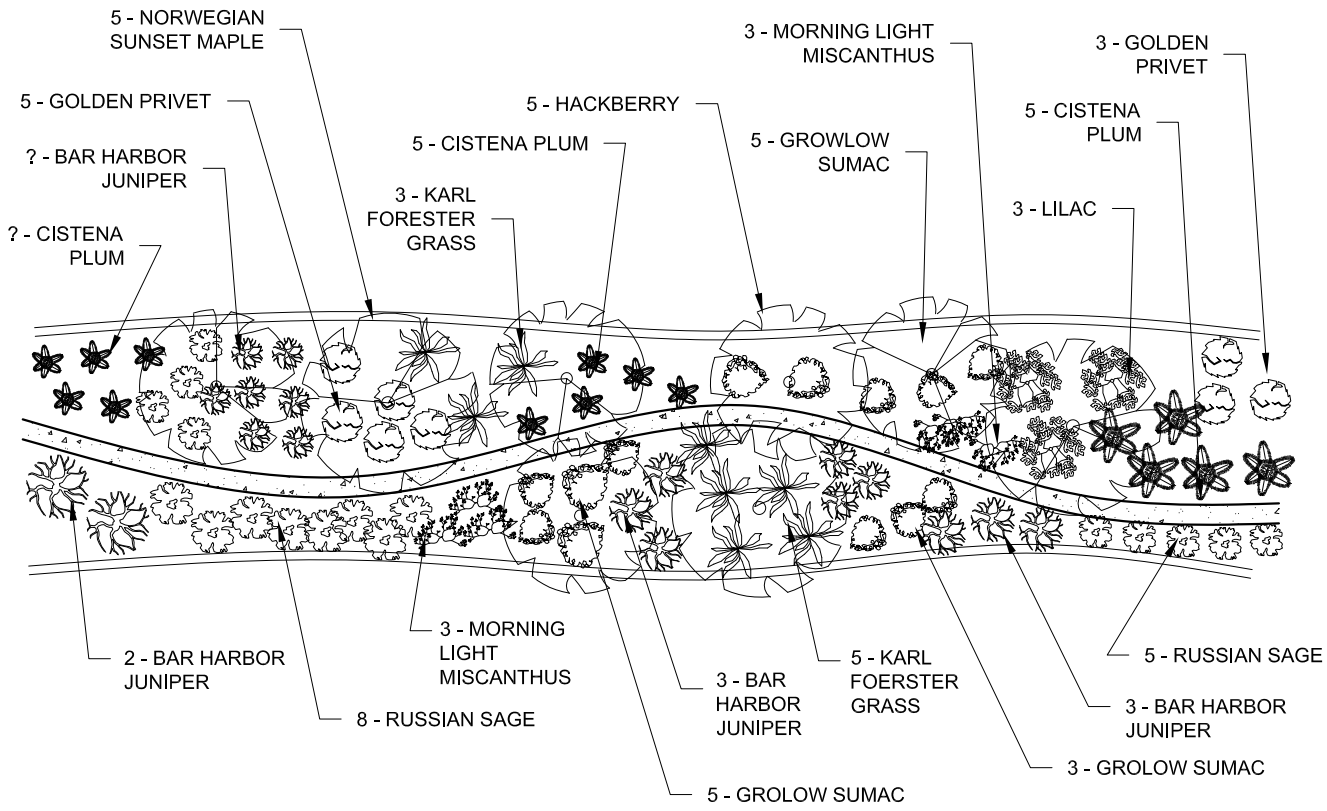
DRAWING DATE MARCH 25, 2009

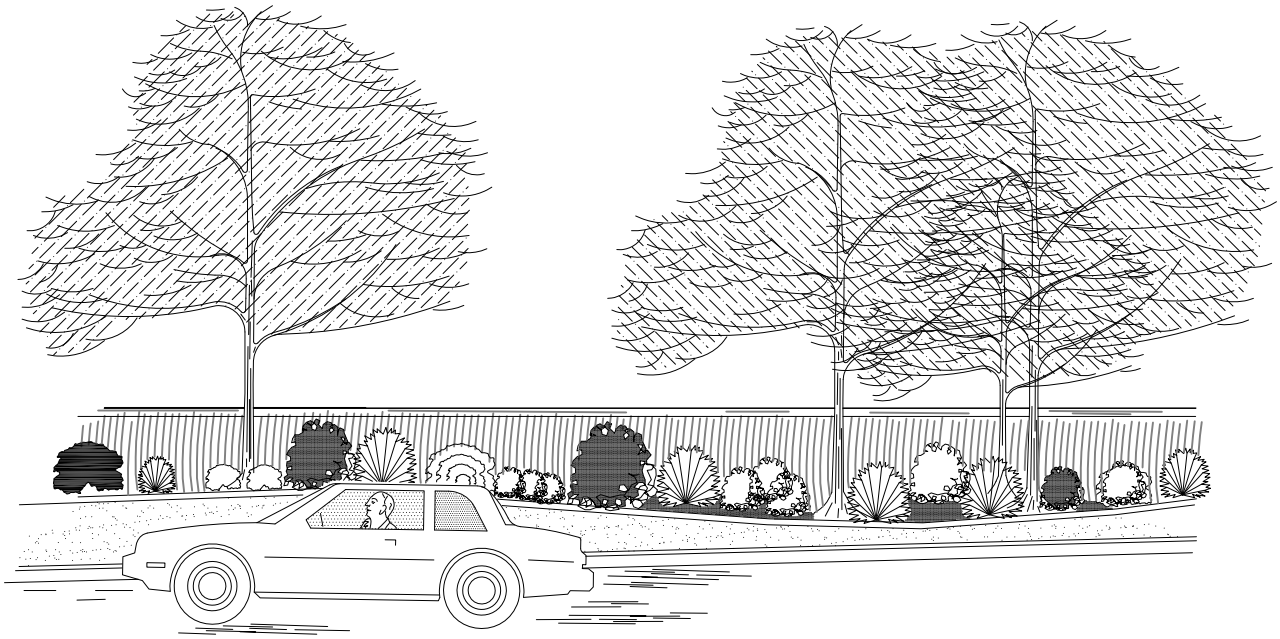
City of West Jordan, Utah

PARKSTRIP "A"

PLAN

PK-025





DRAWING DATE MARCH 25, 2009

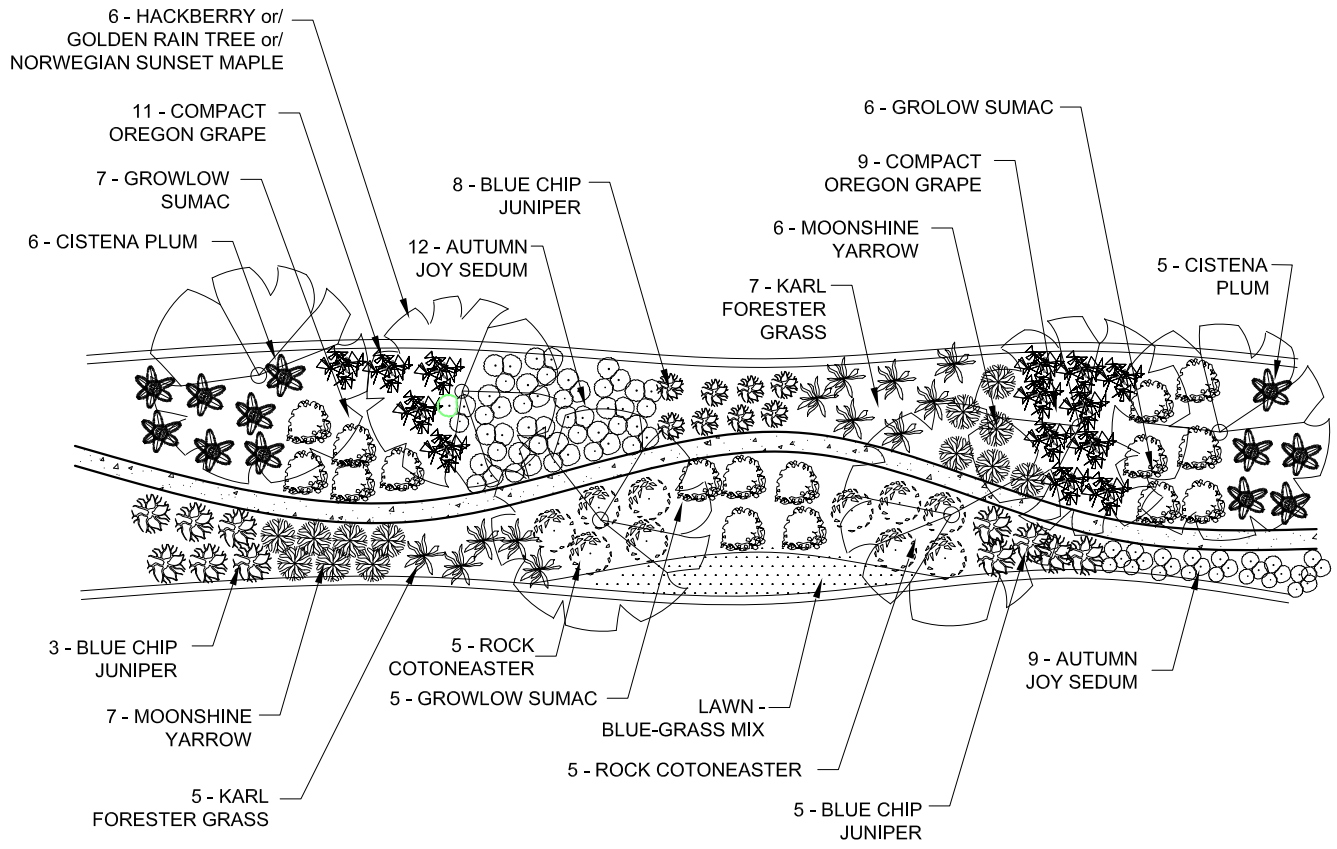
City of West Jordan, Utah

PARKSTRIP 'A-1'

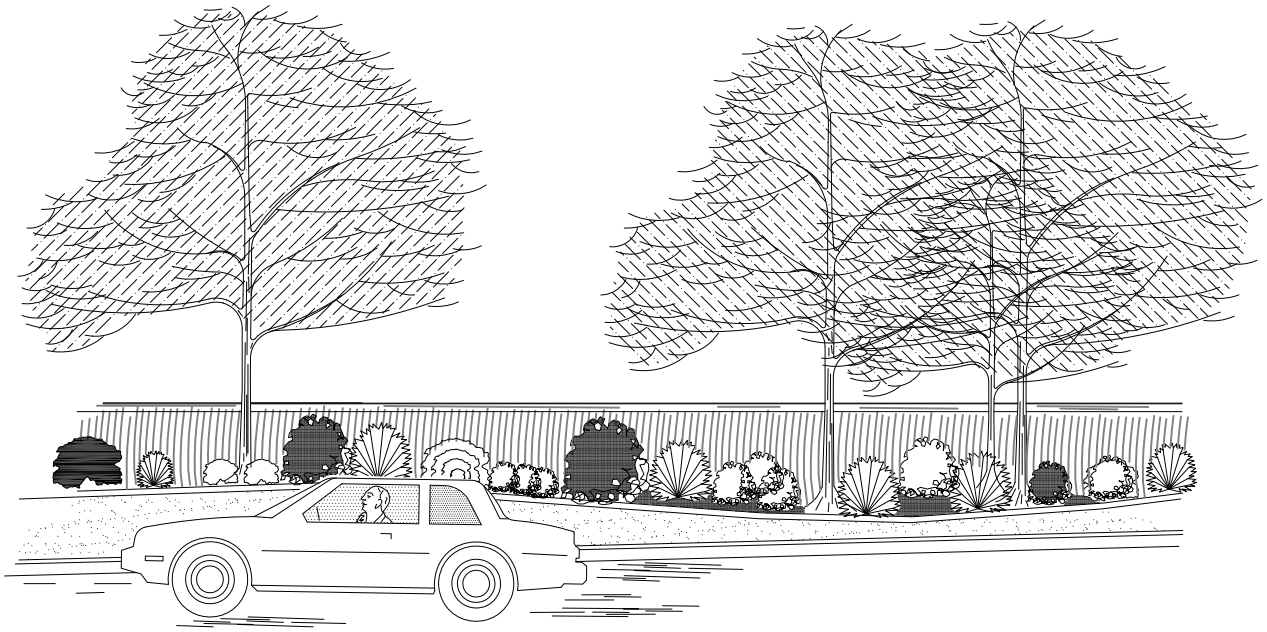
0 % TURFGRASS

PLAN

PK-030



NOTE: WEED FABRIC



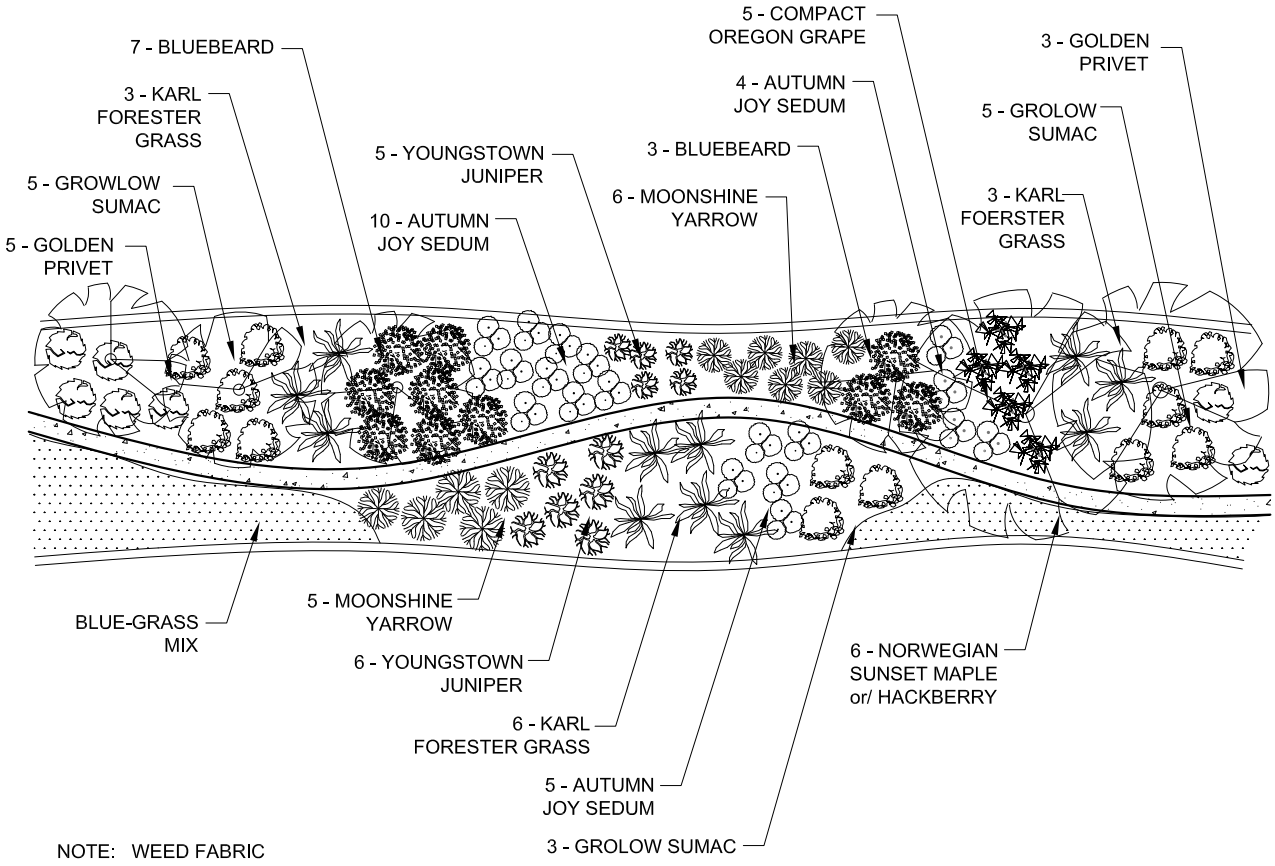
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

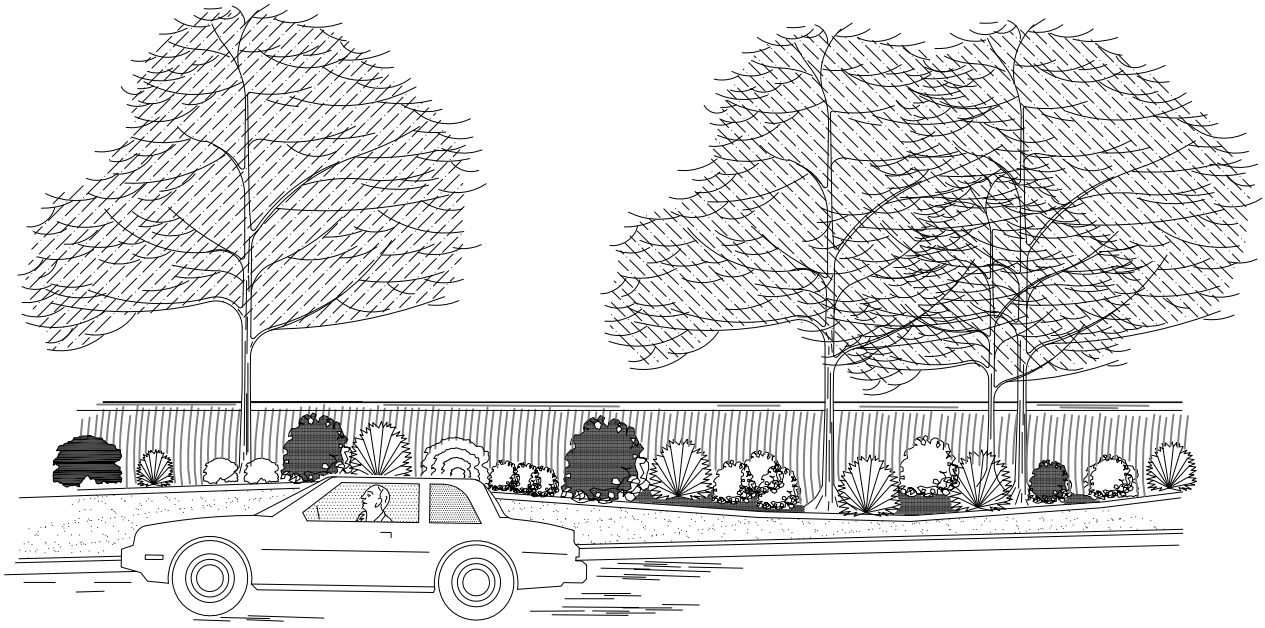
PARK STRIP "B"

PLAN

PK-035



NOTE: WEED FABRIC

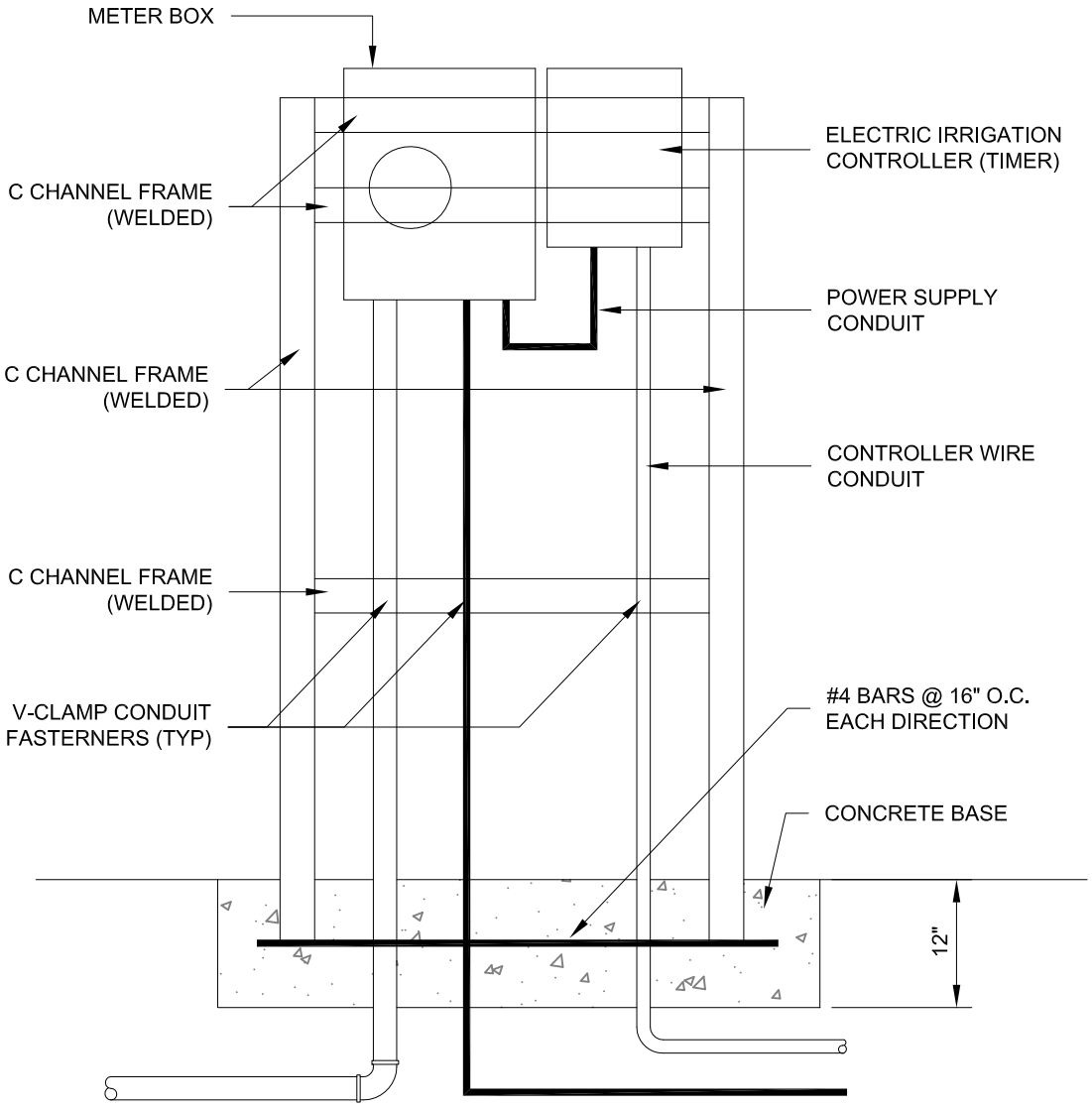


DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

PARK STRIP "C"

PLAN
PK-040



GALVANIZED STEEL CONDUIT: required for all conduit above ground.

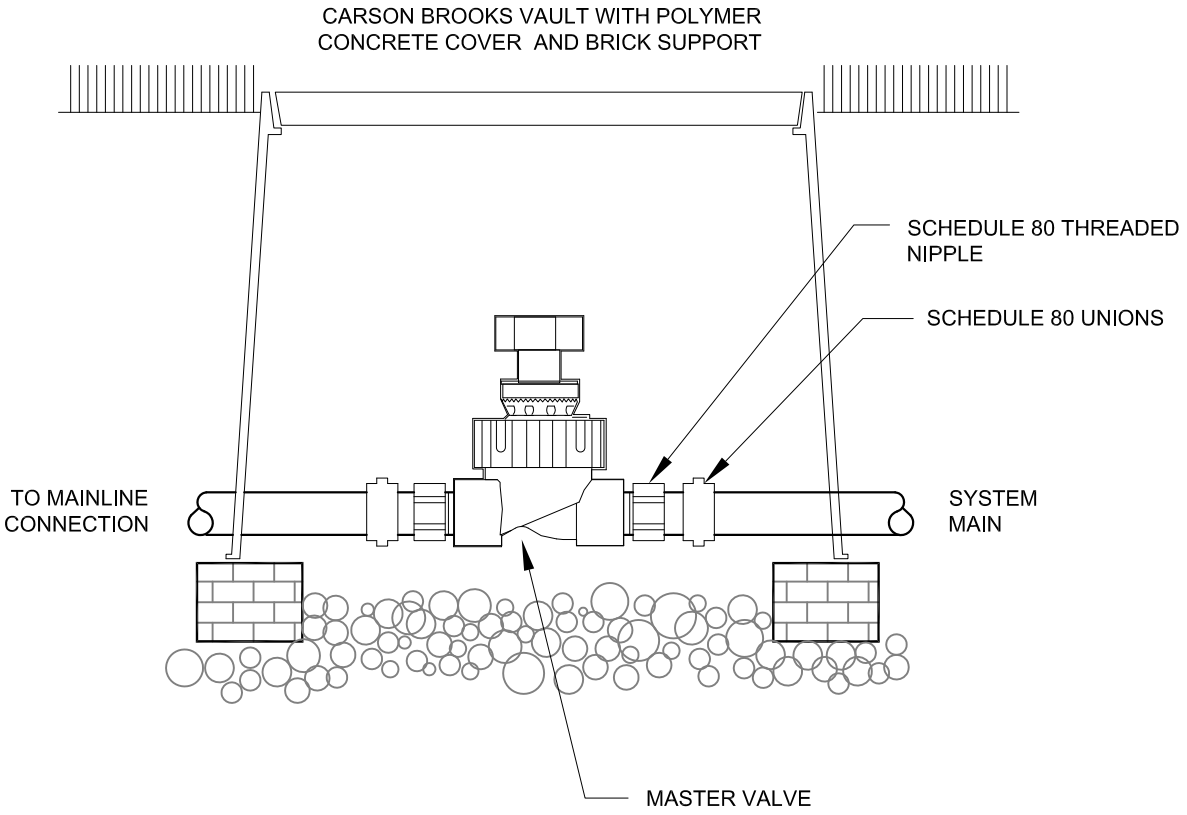
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

PED. MOUNT CONTROLER

PLAN
PK-045

ARAD HIGH PRESSURE HYDROMETERT

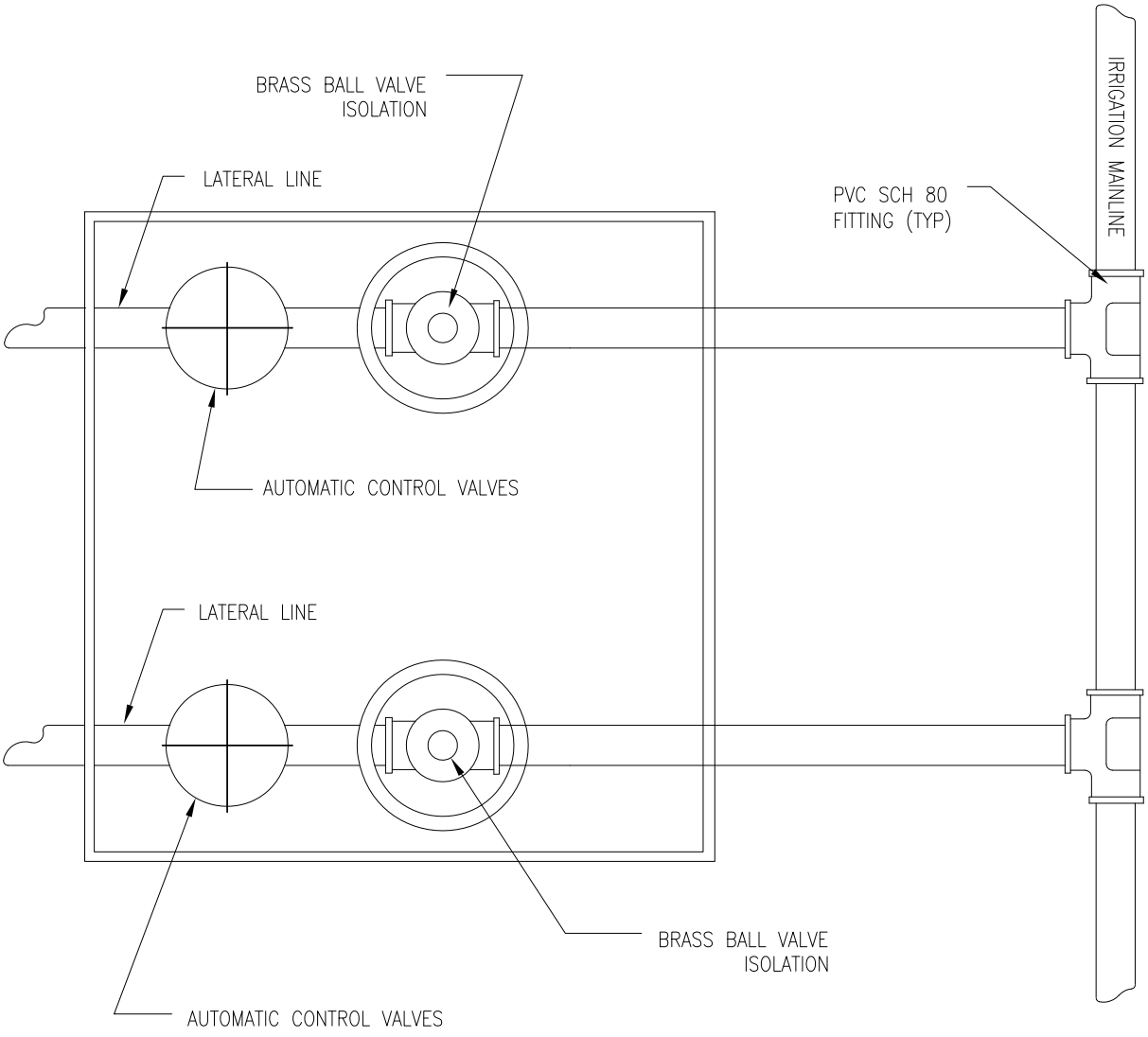


DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

MAINLINE CONNECTION NO.2

PLAN
PK-050



EACH AUTOMATIC CONTROL VALVE NEEDS TO HAVE ITS OWN ISOLATION VALVE (BRASS BALL VALVE)

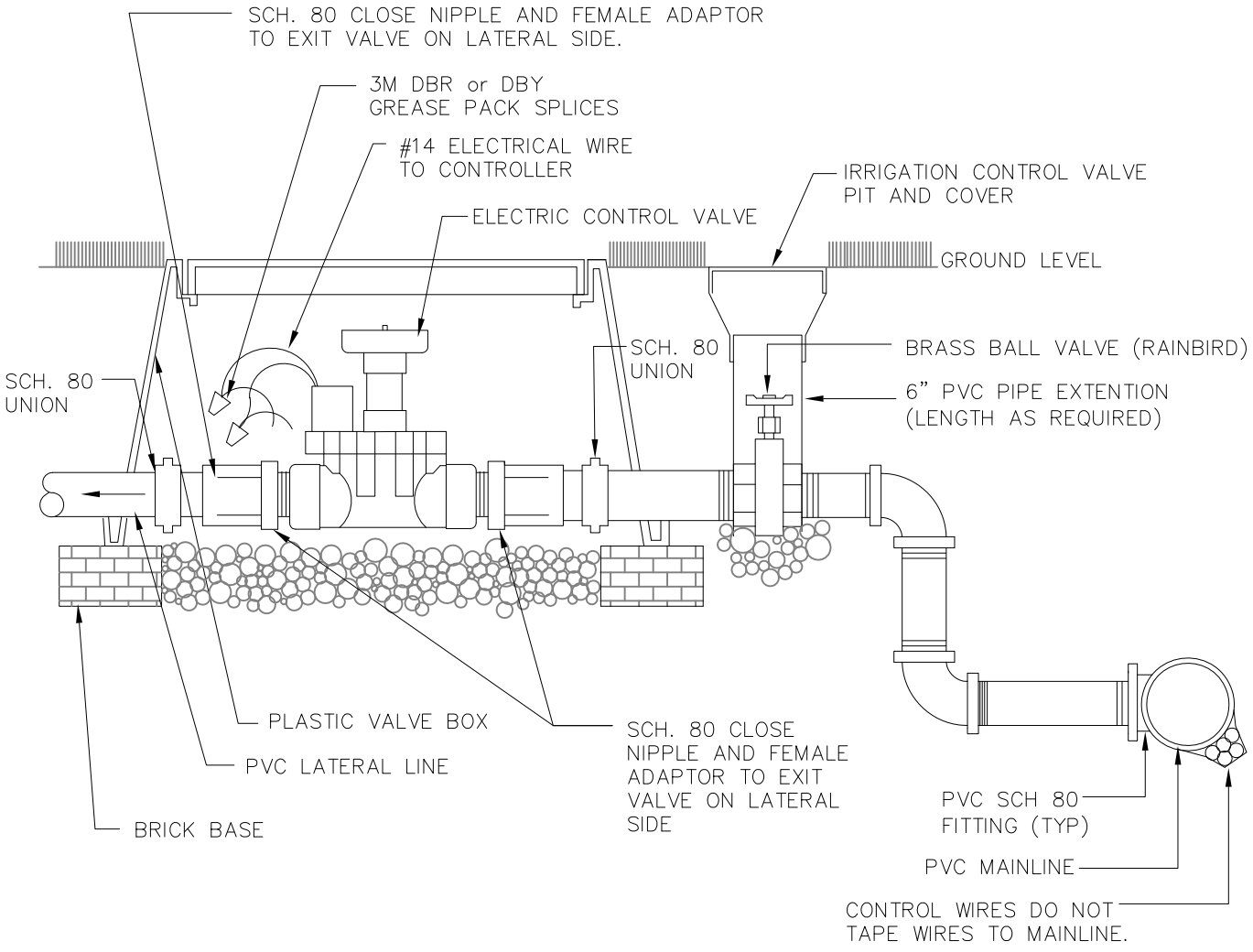
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

VALVE ASSEMBLY

PLAN

PK-055



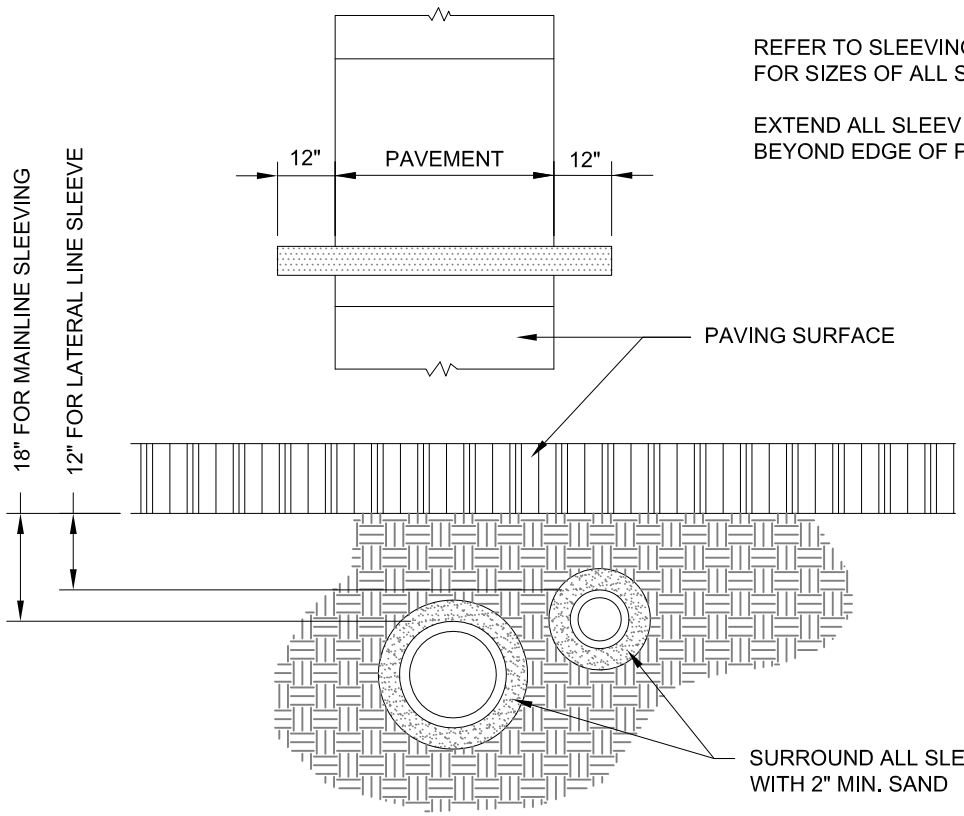
EACH AUTOMATIC CONTROL VALVE NEEDS TO HAVE ITS OWN ISOLATION VALVE (BRASS BALL VALVE)
NO BOTTOM FED AUTOMATIC CONTROL VALVES

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

VALVE ASSEMBLY

PLAN
PK-060



REFER TO SLEEVING DIAGRAM FOR SIZES OF ALL SLEEVES

EXTEND ALL SLEEVING 12" MIN. BEYOND EDGE OF PAVING

SLEEVE SIZE CHART

PIPE SIZE	MIN. SLEEVE SIZE
3/4"	1 1/2"
1"	2"
1 1/4"	2 1/2"
1 1/2"	2 1/2"
2"	3"
2 1/2"	4"
3"	4"
4"	6"
6"	8"

WHEN MULTIPLE PIPES OCCUR IN ONE TRENCH, ADD REQUIRED SLEEVE SIZES TOGETHER FOR 1 SIZE

WIRES SHALL BE IN SEPERATE CONTUIT AS PER CHART BELOW

WIRE CONDUIT SIZES

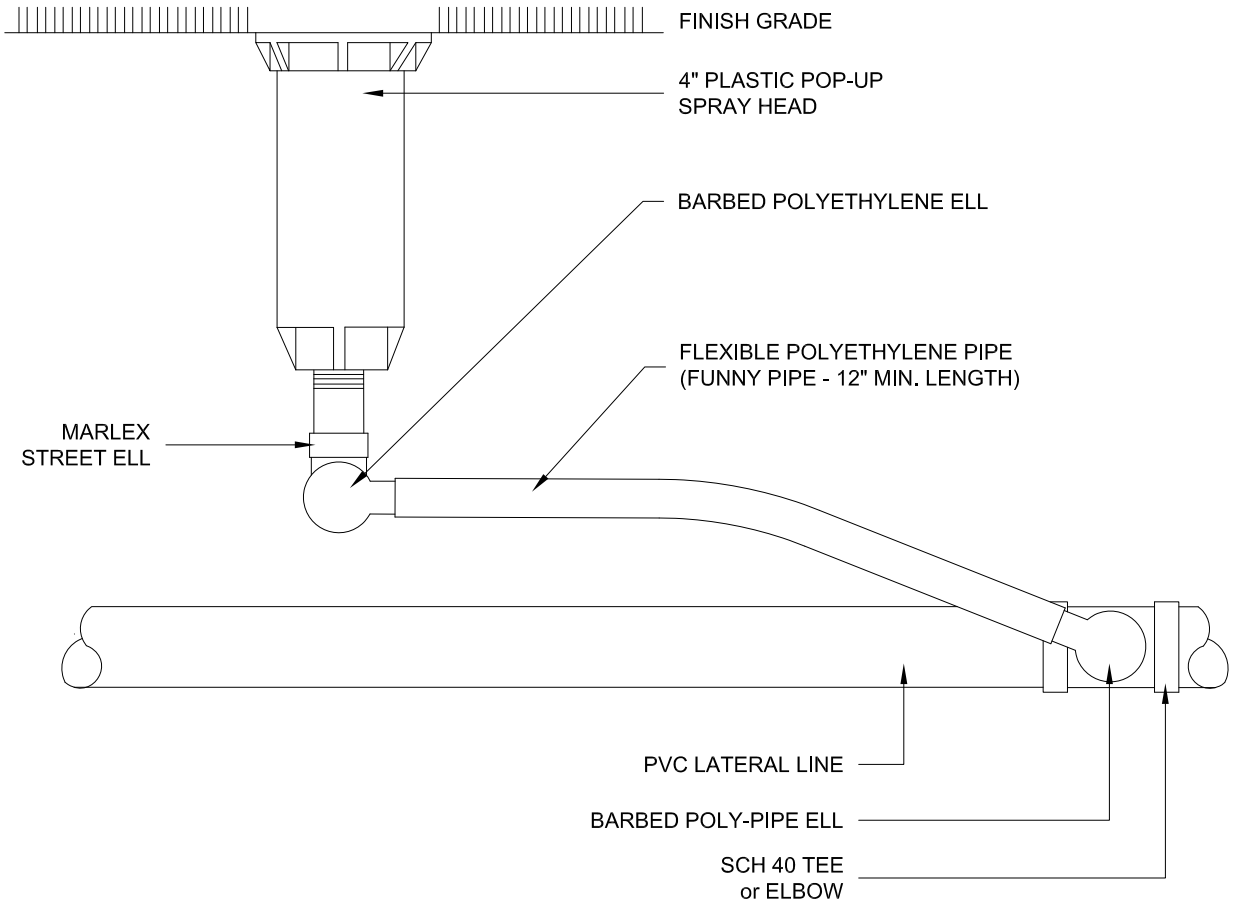
NUMBER OF WIRES	MIN. CONDUIT SIZE
1-4	3/4"
5-7	1"
8-11	1 1/2"
12-22	2"
23-31	2 1/2"
32-36	3"

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

SLEEVING

PLAN
PK-065

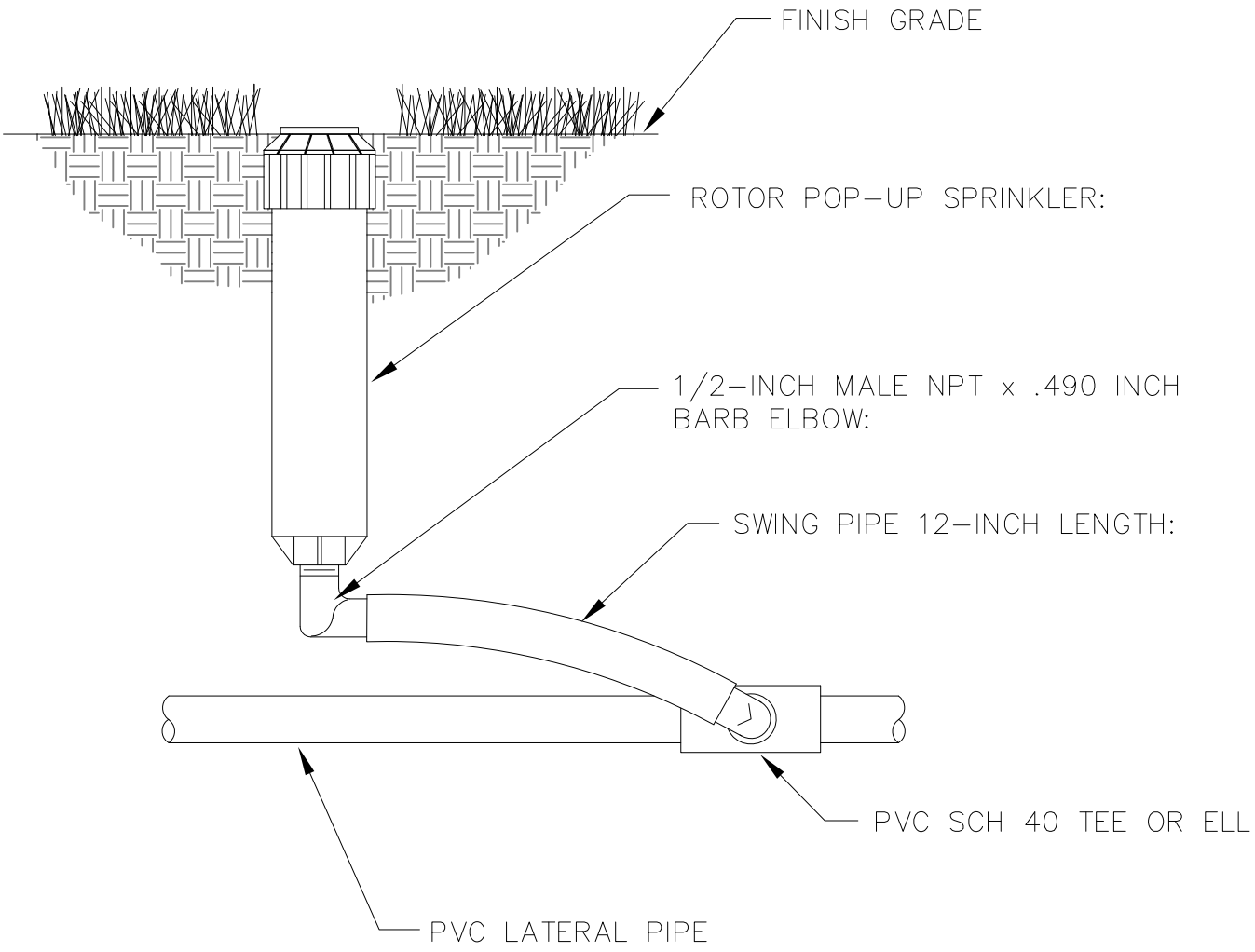


DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

SPRAY POP-UP

PLAN
PK-070



NOTE:

FOR FLOWS ABOVE 4 GPM USE A SWING JOINT INSTEAD OF SWING PIPE OR SWING ASSEMBLY.

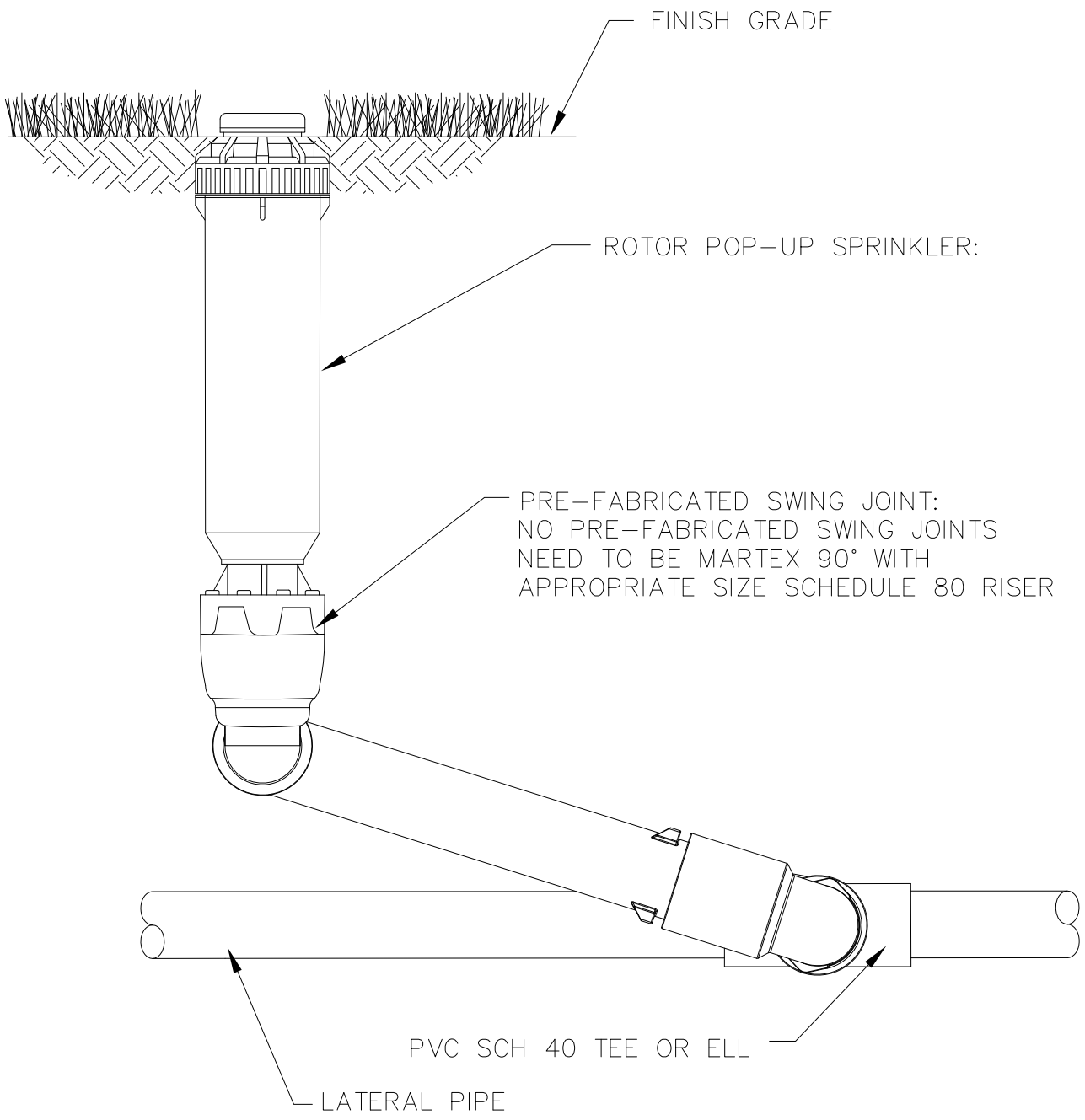
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

ROTOR POP-UP SPRINKLER

PLAN

PK-075



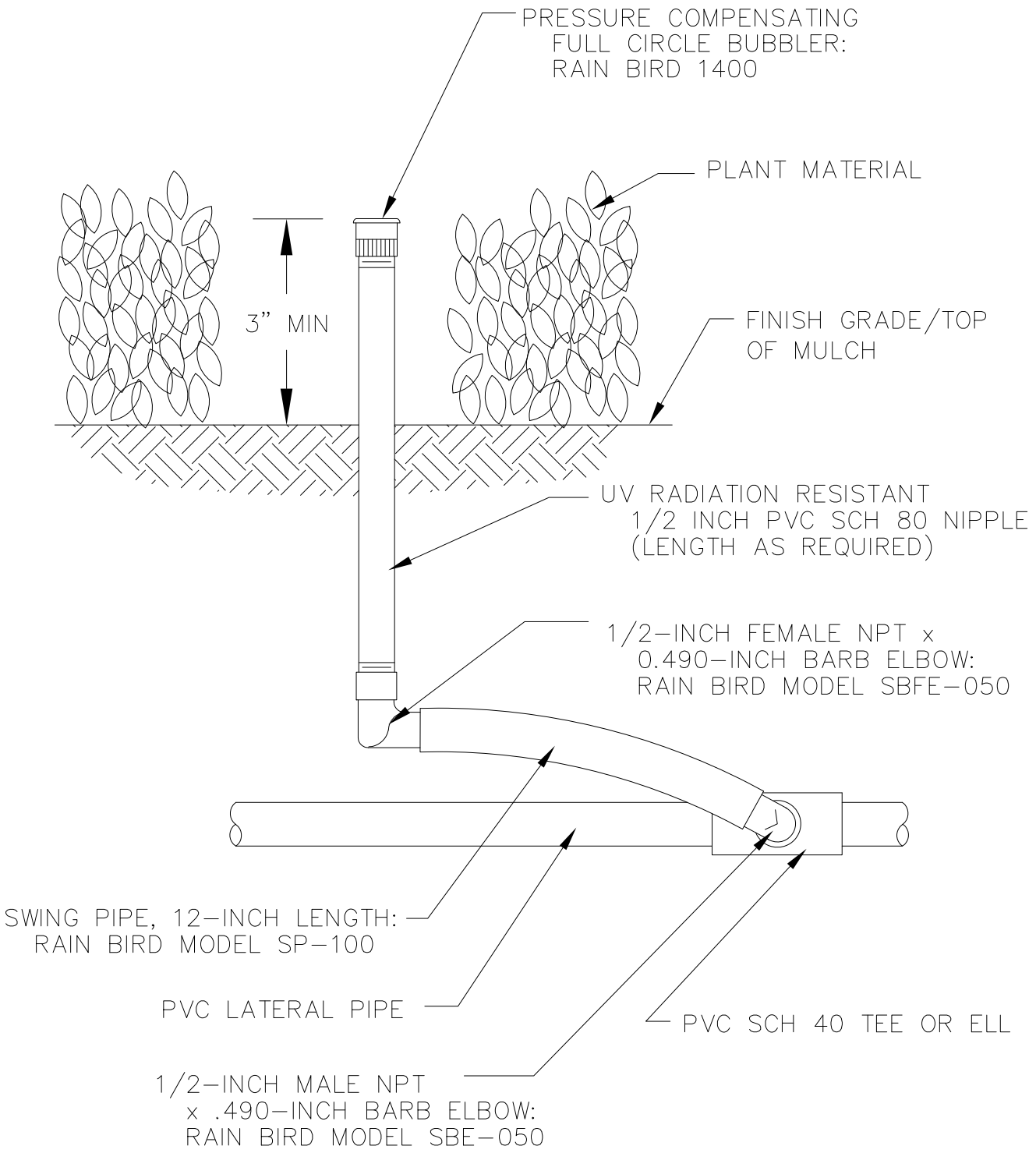
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

BIG ROTOR POP-UP SPRINKLER

PLAN

PK-080

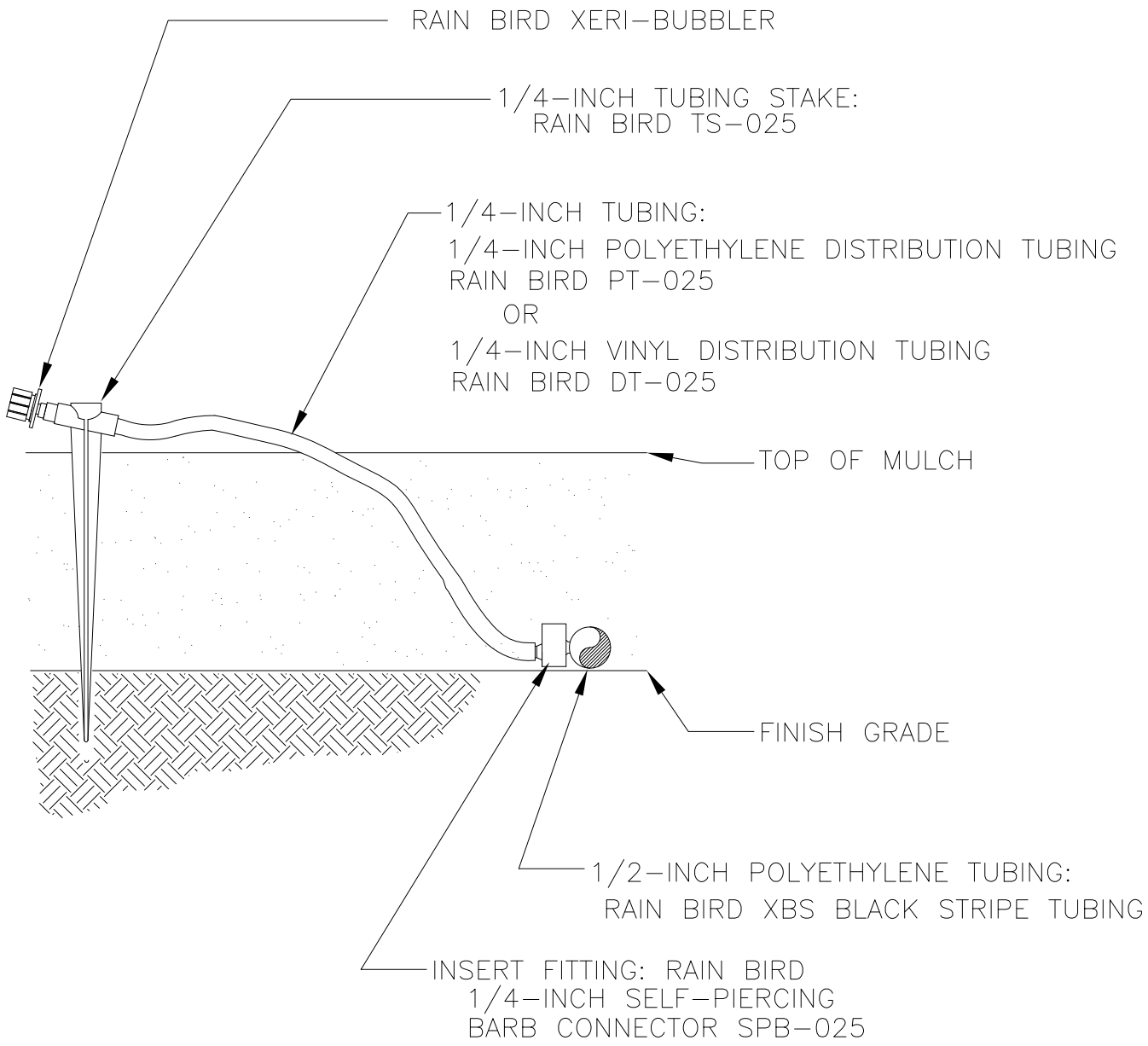


DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

PRESSURE COMPENSATING FULL-CIRCLE BUBBLER

PLAN
PK-085



NOTE:

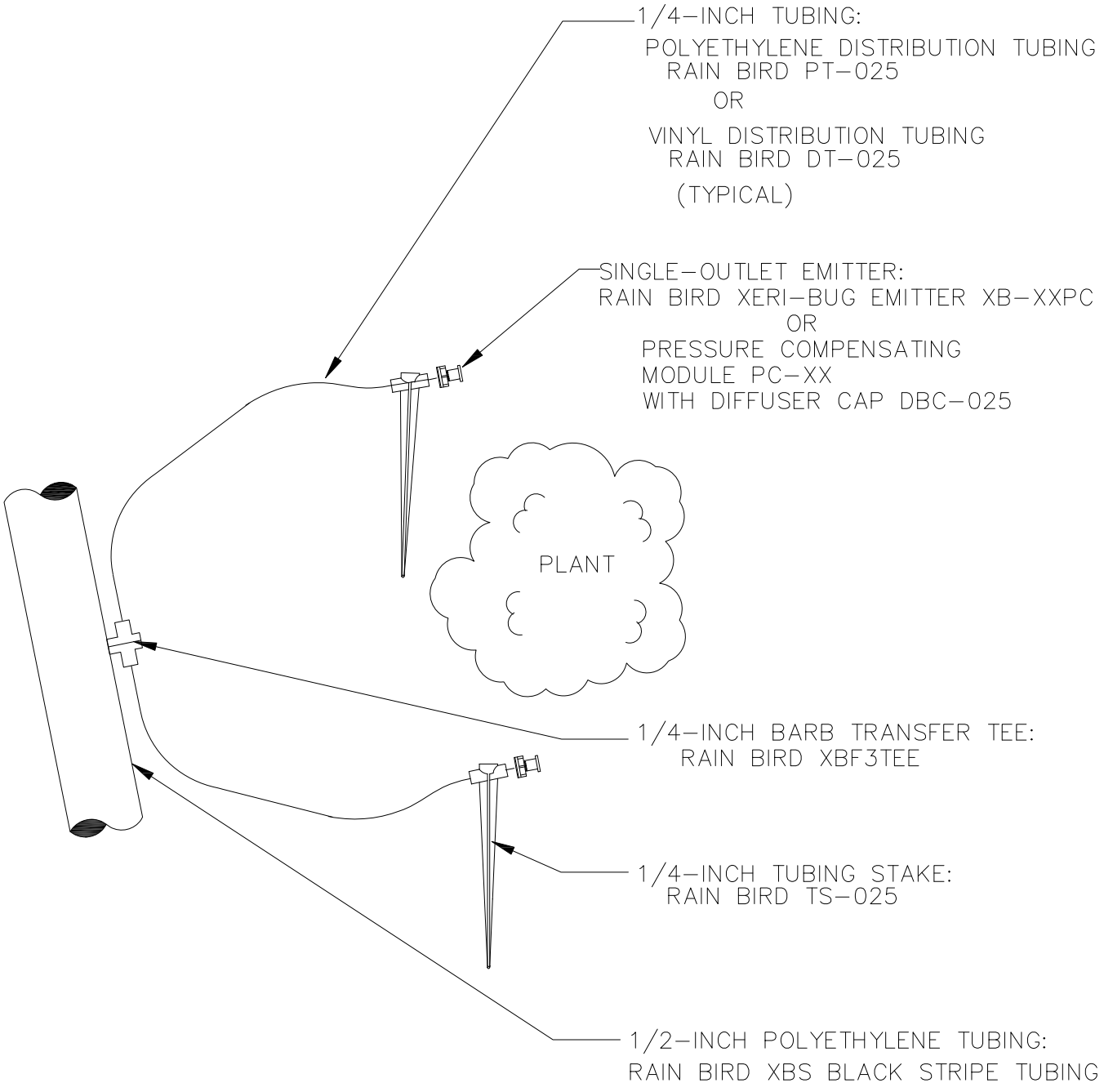
USE XERIMAN TOOL XM-TOOL TO INSERT CONNECTOR DIRECTLY INTO 1/2-INCH POLYETHYLENE TUBING.

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

XERI-BUBBLER ON 1/4" TUBING

PLAN
PK-090



NOTE:

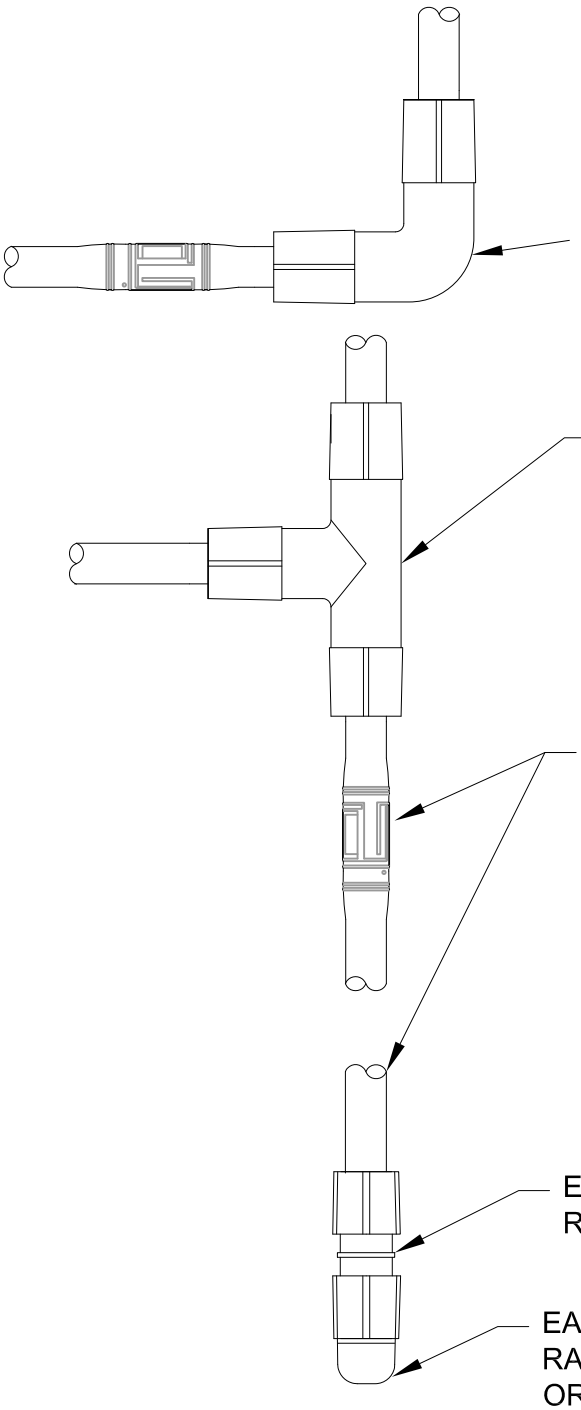
USE XERIMAN TOOL XM-TOOL TO INSERT CONNECTOR DIRECTLY INTO 1/2-INCH POLYETHYLENE TUBING.

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

EMITTERS AROUND PLANT
ON 1/4 INCH TUBING

PLAN
PK-095



EASY FIT COMPRESSION ELBOW:
RAIN BIRD MDCFEL

EASY FIT COMPRESSION TEE:
RAIN BIRD MDCFTEE

LANDSCAPE DRIPLINE TUBING:
RAIN BIRD LANDSCAPE DRIPLINE
LD-XX-XX
OR
RAIN BIRD PURPLE LANDSCAPE
DRIPLINE LDP-XX-XX
OR
1/2-INCH POLYETHYLENE PIPE:
RAIN BIRD XBS
BLACK STRIPE TUBING

EASY FIT COMPRESSION COUPLING:
RAIN BIRD MDCFCOUP

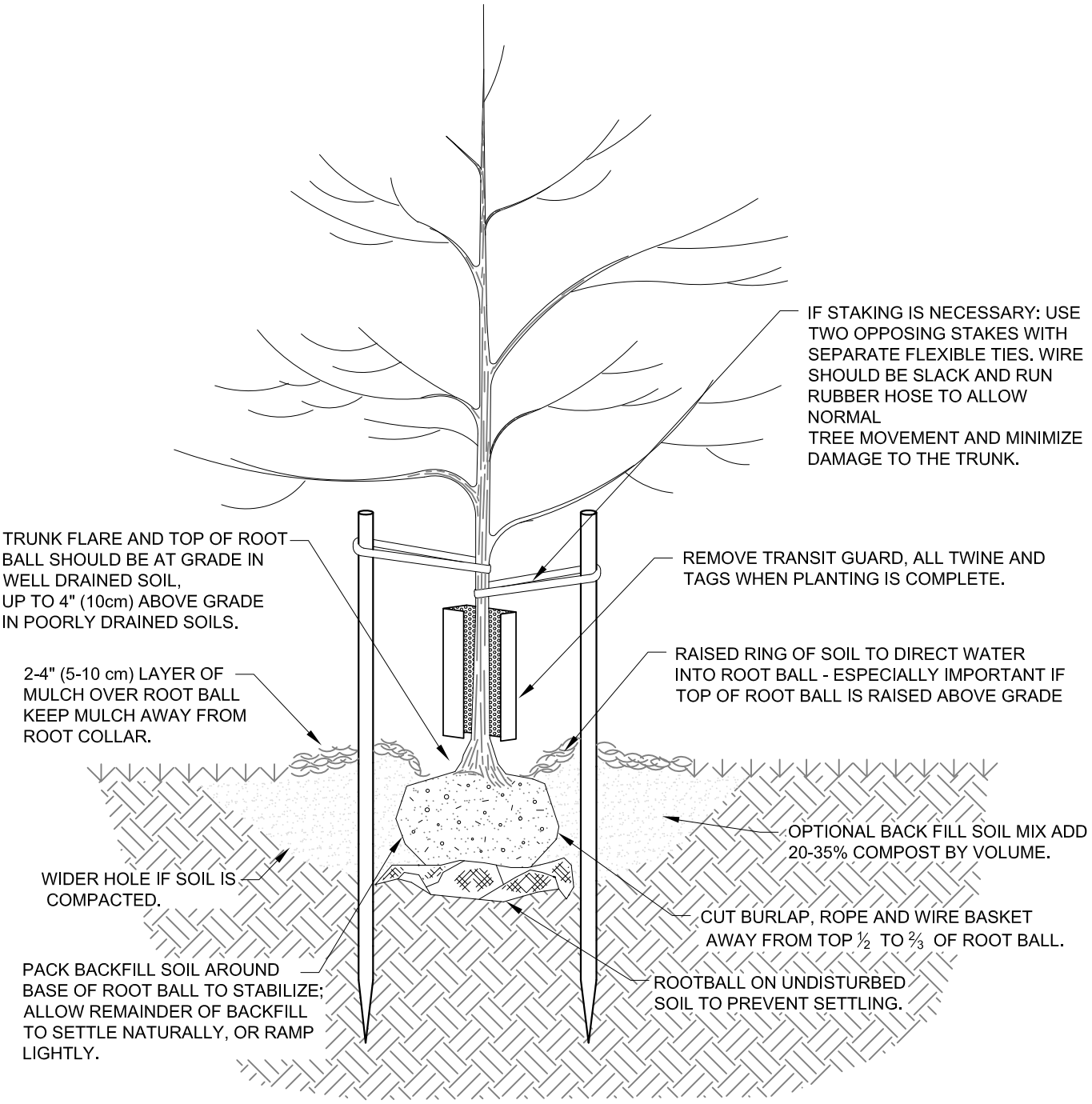
EASY FIT COMPRESSION FLUSH CAP:
RAIN BIRD MDCFCAP
OR
EASY FIT PURPLE COMPRESSION FLUSH CAP:
RAIN BIRD MDCFPCAP

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

EASY FIT COMPRESSION FITTINGS

PLAN
PK-100



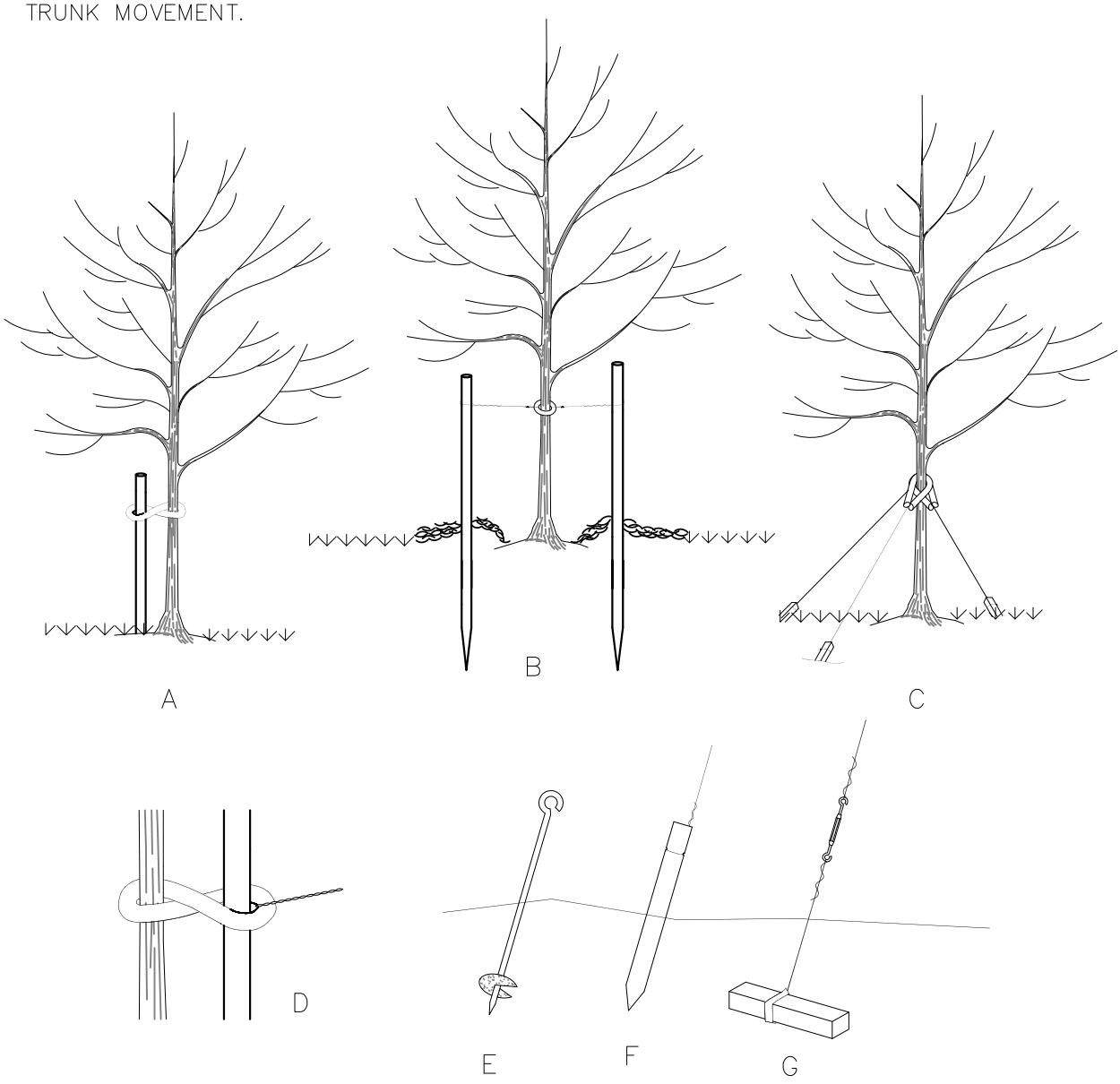
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

TREE PLANTING & STAKING

PLAN
PK-105

A SINGLE STAKE IS OFTEN USED ON SMALL TREES. A SINGLE STAKE SHOULD BE PLACED ON THE SIDE OF THE TREE TOWARD THE PREVAILING WINDS SO THE TREE IS BLOWN AWAY FROM THE STAKE. TWO STAKES, WITH SEPARATE FLEXIBLE TIES IS USUALLY RECOMMENDED. IT IS OFTEN EASIER TO INSTALL STAKES BEFORE THE HOLE IS BACKFILLED. GUY WIRES ARE USED ON LARGER TREES. THE GUYS ARE BEST SECURED BY SPECIALLY DESIGNED LAND ANCHORS OR DEADMEN BURIED IN THE SOIL, AND THEY SHOULD BE AT A 45–DEGREE ANGLE WITH THE TRUNK. GALVANIZED STEEL CABLE IS BEST. TURNBUCKLES CAN BE INSTALLED TO ADJUST THE LENGTH. COMPRESSION SPRINGS CAN PROVIDE FLEXIBLITY FOR TRUNK MOVEMENT.



THREE METHODS OF STAKING AND GUYING TREES. A SINGLE STAKE USED FOR TREES UP TO 2IN (5CM) IN DIAMETER. THE TREE IS ATTACHED TO THE STAKE BY MEANS OF A WIRE RUN THROUGH A PIECE OF HOSE (D), B TREES 2 TO 4IN (5 TO 10CM) IN DIAMETER ARE SUPPORTED BY TWO OR THREE STAKES. ATTACHMENT IS THE SAME AS IN A, AND THE STAKES SHOULD BE PLACED SO THE BRANCHES DO NOT RUB AGAINST THEM. C TREES OVER 4IN (10CM) IN DIAMETER SHOULD BE GUYED WITH AT LEAST THREE GUYS. GABLE OR WIRE IS ATTACHED TO THE TREE BY RUNNING WIRES THROUGH A PIECE OF HOSE OR BY USING LAG HOOKS ON LARGE TREES, THE GUYS SHOULD BE SECURED TO ARROWHEAD SHAPED LAND ANCHORES (E), WOODEN STAKES (F), OR DEADMEN BURIED IN THE SOIL (G).

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

TREE PLANTING & STAKING

PLAN
PK-110

SUPPORT SYSTEM

STAKING, GUYING, OR BRACING REFERS TO THE METHOD OF MECHANICALLY SUPPORTING THE TRUCK OF A PLANTED TREE TO KEEP IT IN AN UPRIGHT POSITIONS. STAKING IS BOTH EXPENSIVE AND TIME COMSUMING AND MAY PRESENT A HAZARD FOR PEOPLE WHO MAY TRIP OR FALL OVER THE SUPPORTS. STAKING TOO RIGIDLY CAN REDUCE TRUNK TAPER ON SMALL TREES. SMALL TREES MAY BE TOO WEAK TO STAY UPRIGHT ON THEIR OWN WHEN THE STAKE IS REMOVED. IF THE WIRES ARE LEFT IN PLACE TOO LONG, THE TRUCK CAN BE GIRDLING CAN OCCUR.

BARE ROOT TREES, FABRIC BAG, AND CONTAINER–GROWN TREES WITH SMALL, LIGHTWEIGHT ROOT BALLS MY REQUIRE SUPPORT UNTIL LATERAL OR ANCHOR ROOTS DEVELOP, BUT SELDOM MORE THAN ONE YEAR. LARGE EVERGREENS MAY NEED TO BE GUYED FOR UP TO TWO YEARS BECAUSE OF THE WIND RESISTANCE OF THE FOLIAGE AND EXTRA WEIGHT OF SNOW AND ICE ACCUMULATION DURING THE WINTER WHEN THE SOIL IS WET. EXTREMELY WINDY CLIMATES, OR OTHER UNUSUAL CIRCUMSTANCES, MAY ALSO CALL FOR EXTENSIVE OF STAKES.

WHEN STKING IS NEEDED TO KEEP A TREE WITH A STRONG, STRAIGHT TRUNK IN THE UPRIGHT POSITION UNTIL THE ROOTS CAN GROW TO ANCHOR THE TREE, LOW STAKING CAN KEEP THE TREE IN PLACE WHILE PERMITTING THE TOP TO MOVE FREELY. IF THE TRUNK IS WEAK, SUPPORT THE TREE WITH A STAKE ABOUT 6 IN (15CM) ABOVE THE LOWEST LEVEL AT WHICH THE TRUCK CAN BE HELD UPRIGHT.

DRAWING DATE MARCH 25, 2009

TREE PLANTING & STAKING

PLAN

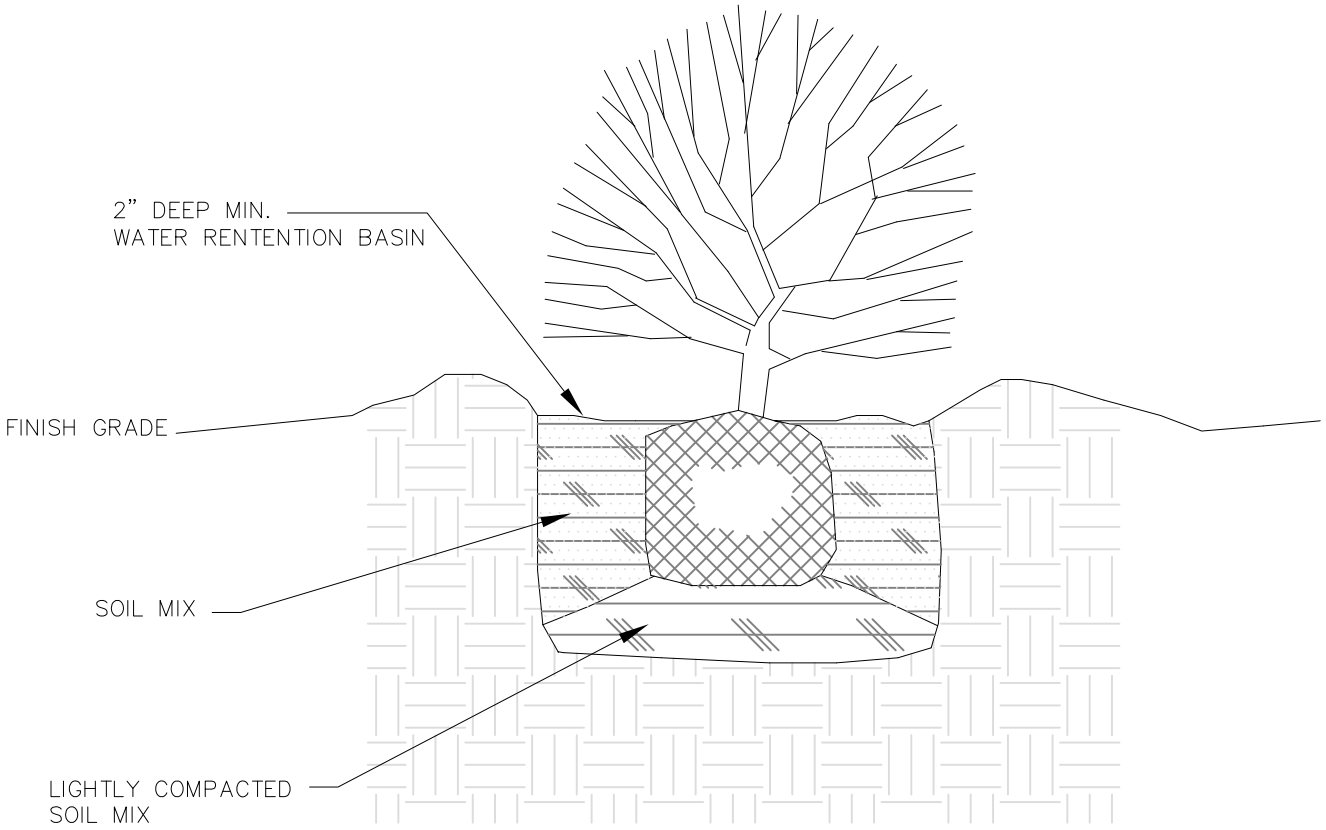
PK-110

SOIL MIX: for all trees, shrubs and ground cover shall be 30% existing soil excavated from plant hole, 30% imported loamy topsoil, 20% clean coarse sand and 20% peat moss.

PLACE AGRIFORM TABS: in each planting pit, buried 1/3 depth of ball.

PLACE TABS AS FOLLOWS:
#1 & #2 size – 1 tab
#5 size – 2 tabs
1 1/2" cal. & up – 3 tabs

PLACE TABS: no closer than 18" apart.



TYPICAL SHRUB PLANING DEBTH:
Depth of ball plus 3"

TYPICAL SHRUB PLANING WIDTH:
Width of ball plus 6"

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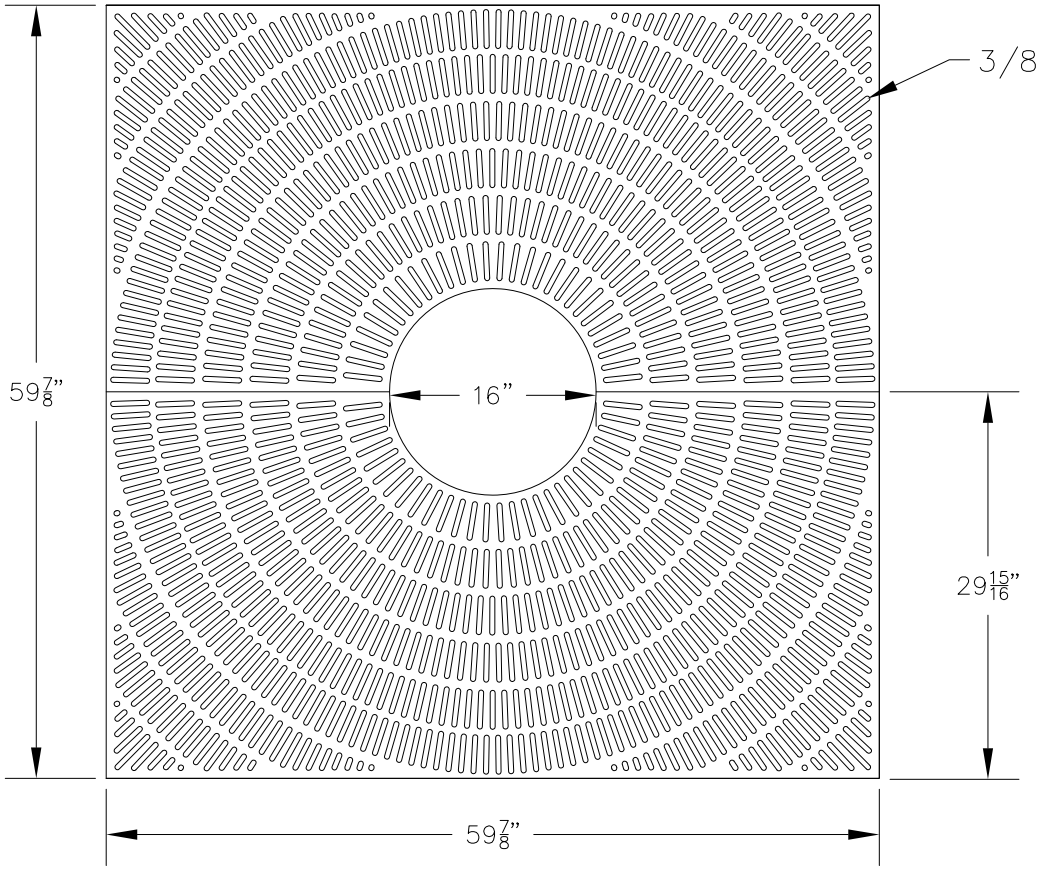
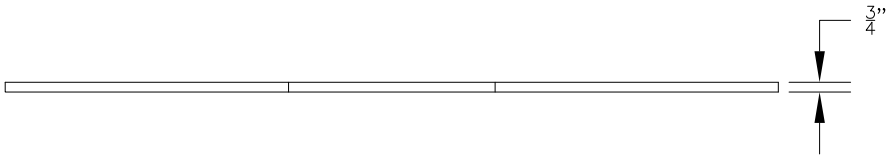
City of West Jordan, Utah

SHRUB PLANTING DETAIL

PLAN
PK-115





NOTES:
MATERIAL; DUCTILE CAST IRON ASTM, A536, CL 80–55–06
TWO PIECE SET
3/4" THICK GRATE

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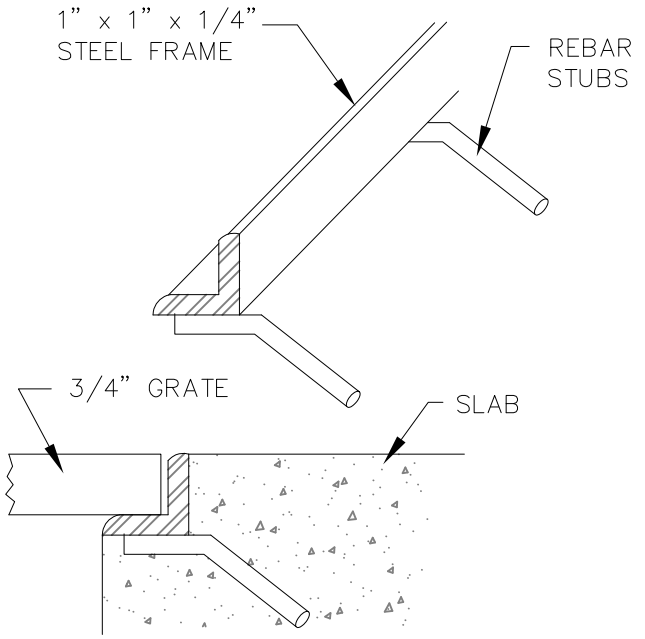
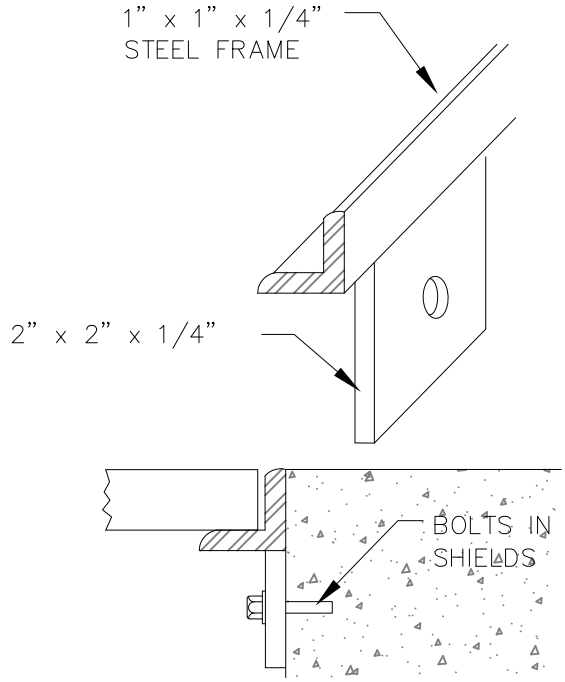
City of West Jordan, Utah

60 " SQUARE STYLE "STA" TREE GRATE
FRAMING

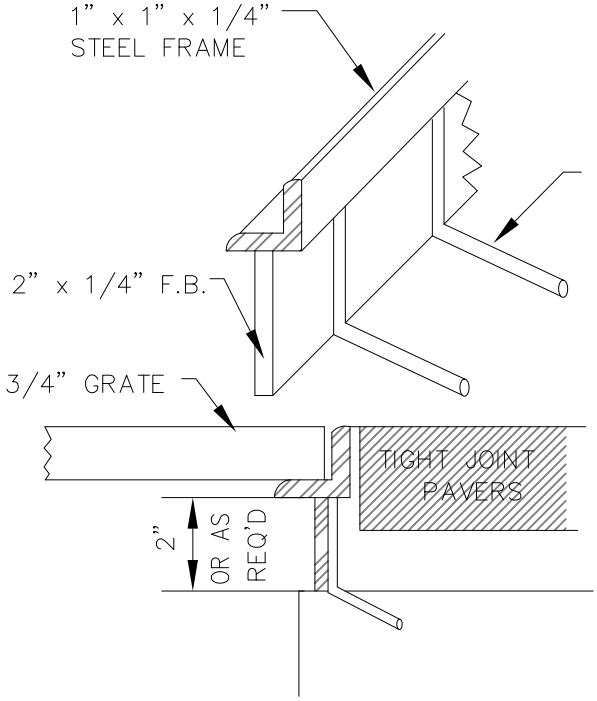
PLAN
PK-120



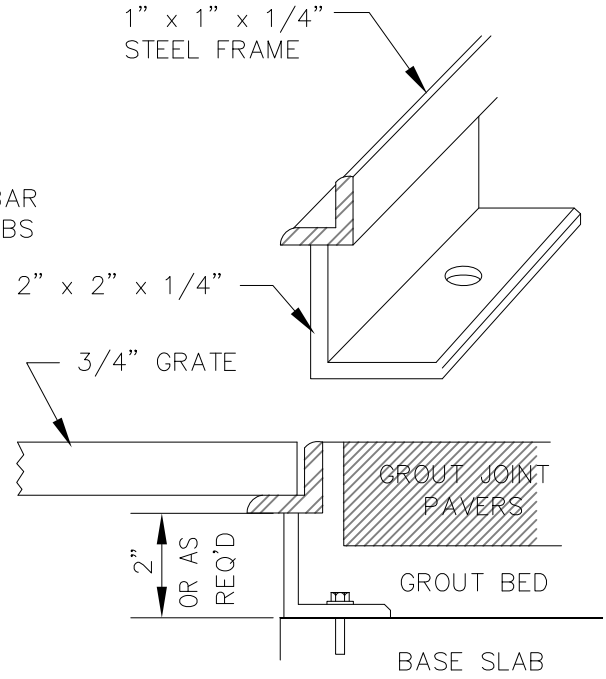
STYLE "C1" (FOR NEW SLAB)



STYLE "RF" (FOR EXISTING SLAB)



STYLE "CIP" (FOR PAVING WITH NEW SUBSLAB, SAND SETTING BED)

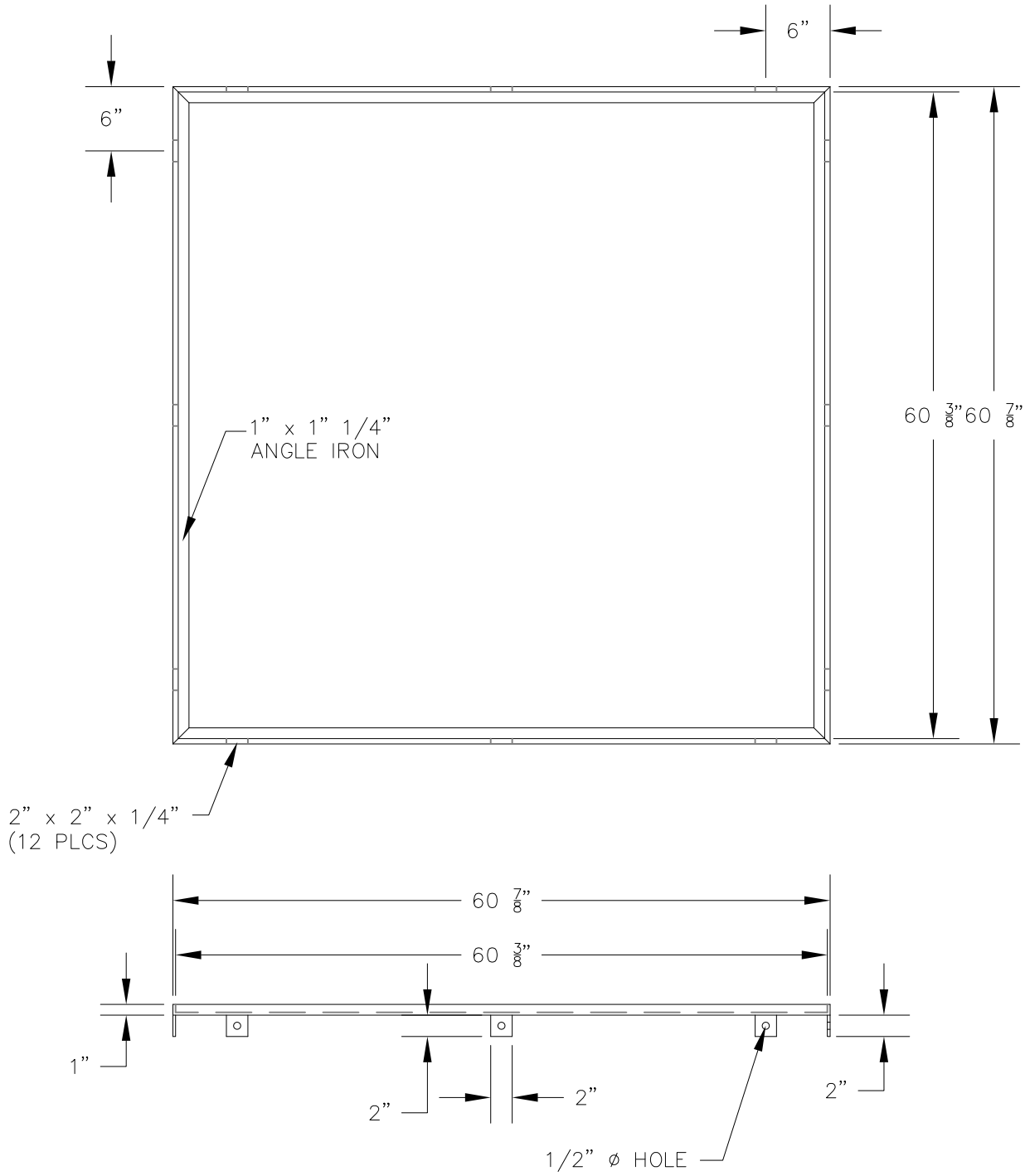


STYLE "AP" (FOR EXISTING SUBSLAB GROUT SETTING BED)

DRAWING DATE MARCH 25, 2009

TREE GRATE FRAMES
FRAMING

PLAN
PK-125



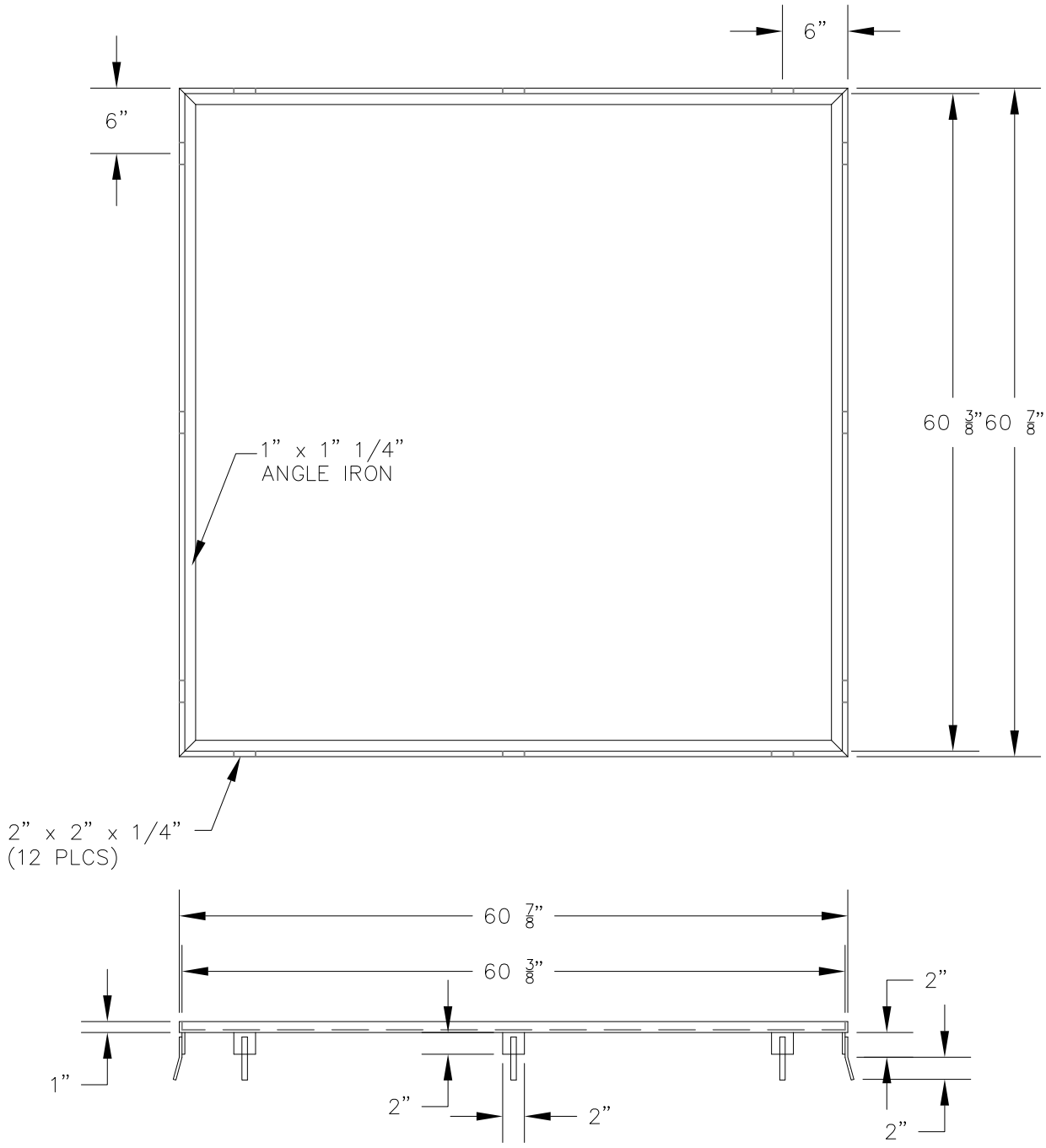
NOTES:
FABRICATED MILD STEEL
FURNISHED BARE UNLESS OTHERWISE SPECIFIED

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

TREE GRATE FRAMES
FRAMING

PLAN
PK-130

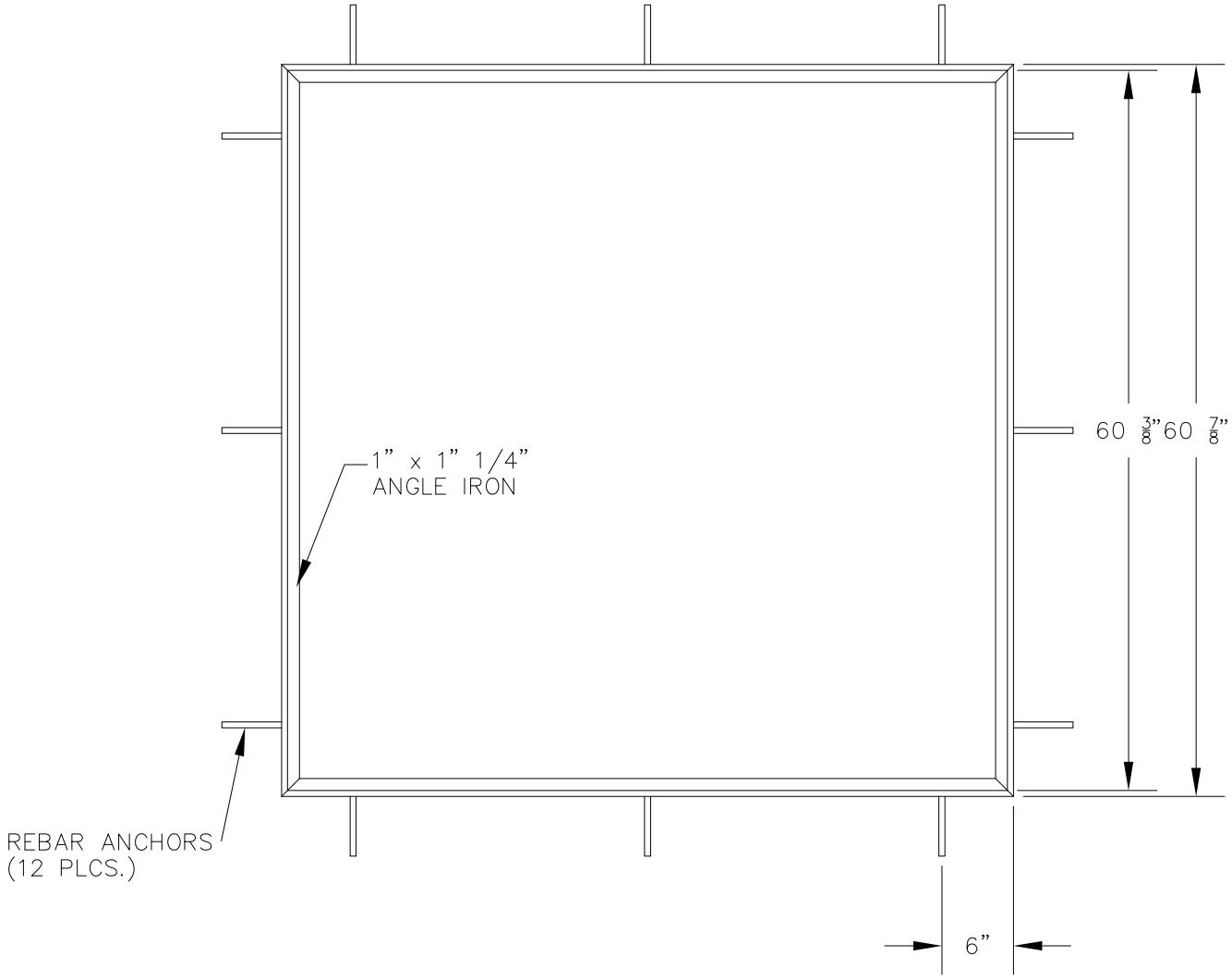


NOTES:
FABRICATED MILD STEEL
FURNISHED BARE UNLESS OTHERWISE SPECIFIED

DRAWING DATE MARCH 25, 2009

TREE GRATE FRAMES
FRAMING

PLAN
PK-135



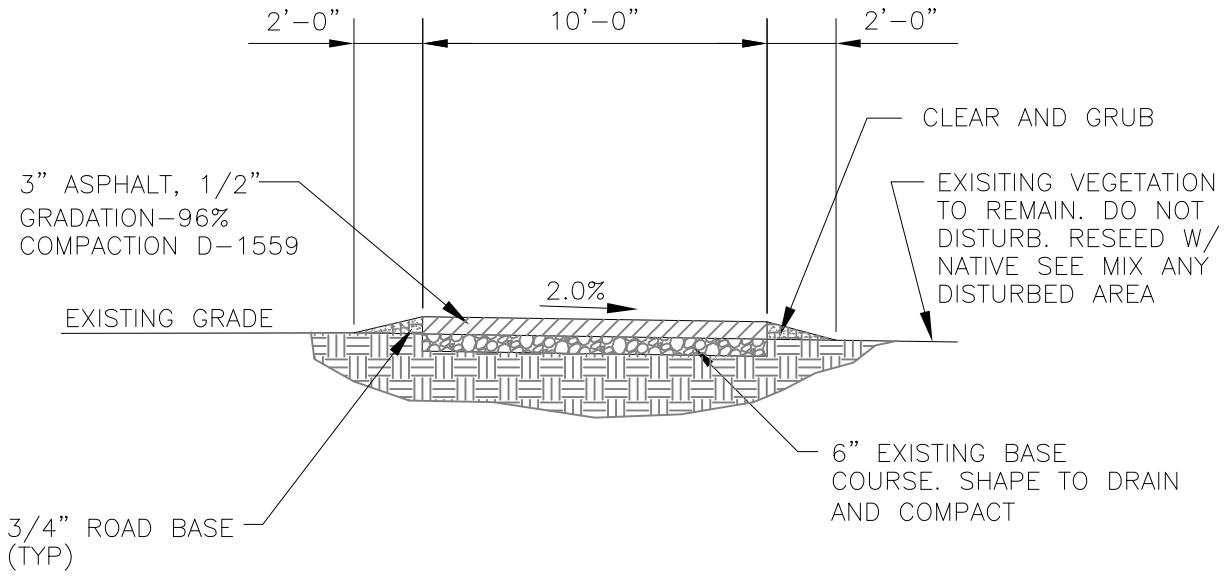
NOTES:
FABRICATED MILD STEEL
FURNISHED BARE UNLESS OTHERWISE SPECIFIED

DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

TREE GRATE FRAMES
FRAMING

PLAN
PK-140



NOTE:

EXISTING BASE & NEW SUBGRADE SHALL BE SPRAYED WITH A HIGH POTENCY HERBICIDE SUCH AS PRAMITOL, OR APPROVED EQUAL. APPLICATION SHALL BE PER MANUFACTURERS SPECIFICATIONS.

PAVE EXISTING TRAIL CROSS SECTION
TYP

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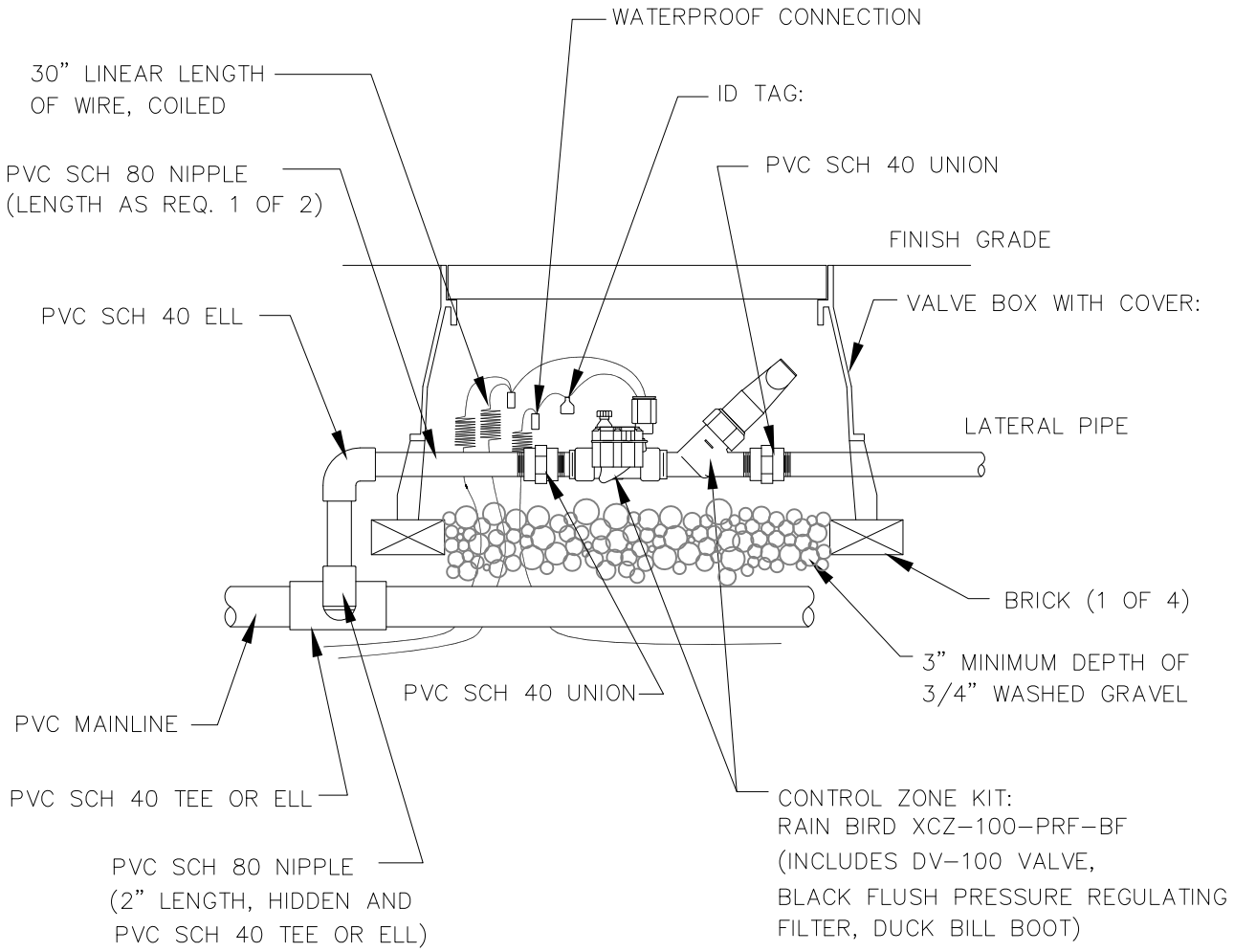
City of West Jordan, Utah

TRAIL CROSS SECTION

PLAN
PK-145



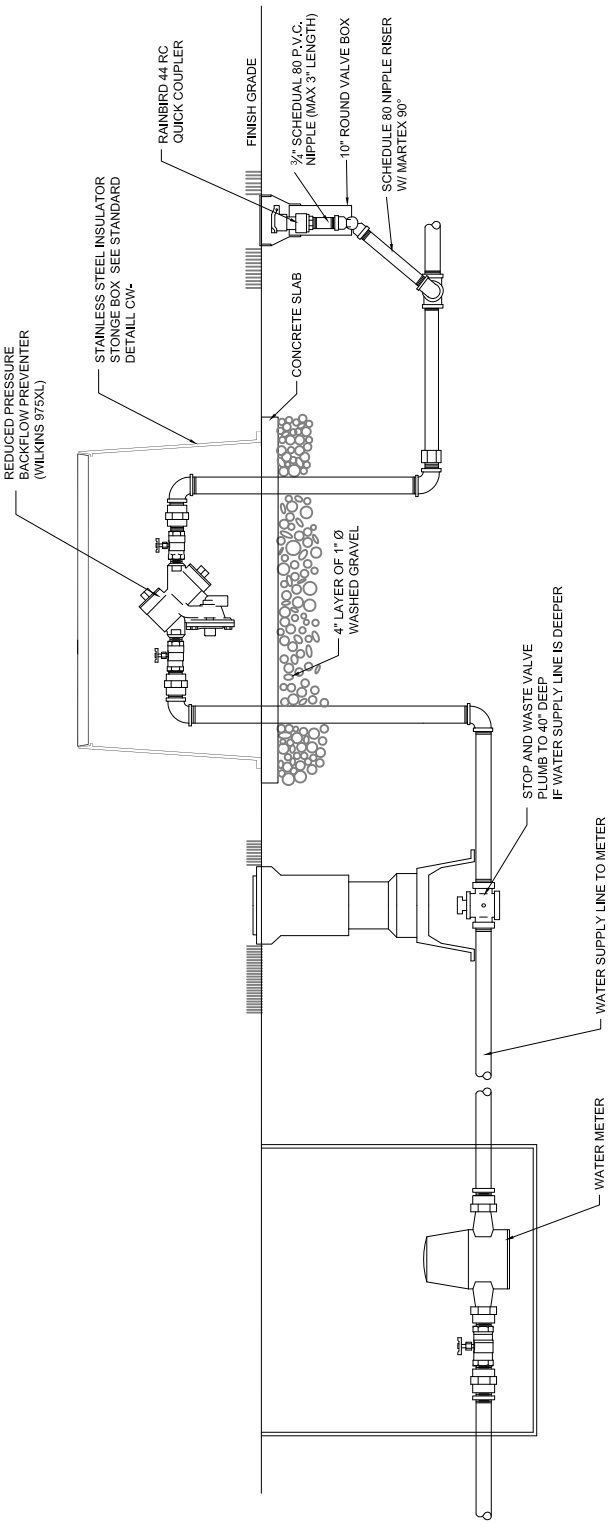
DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

1" CONTROL ZONE KIT W/ PRESSURE REQULATING BLACKFLUSH FILTER

PLAN

PK-150



DRAWING DATE MARCH 25, 2009

City of West Jordan, Utah

PRESSURE REDUCER BACKFLOW PREVENTER

PLAN

PK-155

City of West Jordan
8000 South Redwood Road
West Jordan, Utah 84088
Community Development Dept.
(801) 569-5060

Commercial Landscape Information Package

Multi-family
Mobile home parks
Business/Research Parks
Commercial
Industrial
Professional Office
Manufacturing
Streetscapes
Municipal developments

Table of Contents

Instructions

This Commercial Landscape Information Package is designed to help developers, landscape architects, and irrigation contractors understand the municipal code requirements for commercial landscapes and irrigation systems in the City of West Jordan. The City recognizes that landscape irrigation plays a crucial role in its overall water conservation efforts. The City's code has recently been amended to encourage water-wise landscape designs, efficient irrigation systems, and responsible watering schedules.

Please use this checklist and refer to the municipal code in this package to ensure that all landscape and irrigation plans comply with the requirements **BEFORE** submitting for City approval. Contact the Community Development Department (801)569-5060 with any questions.

Special Reminders:

- All turf areas must pass the irrigation audit with minimum distribution uniformity of 60% (fixed heads) and 70% (rotors heads). Minimizing odd-shapes, curves, and narrow turf areas will help to achieve these efficiency percentages.

- Topsoil Analysis lab results must be included with landscape plans. See code section 89-6-703(a)(3). Qualified labs include:
  QA Consulting and Testing, Salem, UT (801)423-1116
  BYU Soil Analysis Lab, Provo, UT (801)422-2147
  USU Soil Testing Lab, Logan, UT (435)797-2217

- Separate irrigation meters are required for all landscapes over 1,000 square feet.

- Mid-installation inspections are required before irrigation lines are buried. Be sure to notify City two days in advance to schedule this inspection.

- Park strips narrower than 8 feet must use drip irrigation, bubblers, micro-spray, or similar (no pop-up or rotor heads).

Applicant Checklist
Landscape & Irrigation Requirements

Commercial, Municipal, and Multi-Family Developments
City of West Jordan, Utah

Note: Please refer to West Jordan City Municipal Code 89-6-7 (Landscaping) for complete code, including new requirements effective July 21, 2005. This checklist summarizes the new code and is intended to help developers and architects meet all City requirements regarding landscaping and irrigation for commercial, municipal, and multi-family projects.

	Code Section	Description
Submittal Materials, Fees, and Standards		
☐	89-6-703(a)(1)	Pay Landscape Plan Submittal Fee
☐	89-6-703(a)(2)	Landscape Plans prepared by legally qualified designer
☐	89-6-703(a)(2)	Information required on Landscape Plans
☐	89-6-703(a)(4)	Landscape Water Allowance (annual and monthly)
☐	89-6-703(a)(5)	Information required on Irrigation plans
☐	89-6-703(b)	Irrigation Standards, including Utah Irrigation Association Standards
☐	89-6-703(b)(7)	Install separate Landscape Water Meter
☐	89-6-703(a)(3)	Topsoil Analysis lab results and soil amendment recommendations. Qualified labs include: ▪ QA Consulting and Testing, Salem, UT (801)423-1116 ▪ BYU Soil Analysis Lab, Provo, UT (801)422-2147 ▪ USU Soil Testing Lab, Logan, UT (435)797-2217
Landscaping for water conservation		
☐	89-6-704	Plant material and coverage (note: maximum 50% turf, and non-turf areas must use at least 80% water-conserving plants from approved list)
Design, installation, maintenance, and irrigation scheduling		
☐	89-6-705(a)	Design guidelines
☐	89-6-705(b)	Installation guidelines
☐	89-6-705(c)	Landscape maintenance
☐	89-6-705(d)	Tree maintenance
☐	89-6-705(e)	Irrigation schedules
Park strips and streetscapes		
☐	89-6-706	Park strip standards
☐	89-6-706(a)(3)d	Prohibits pop-up and rotor sprinklers on strips narrower than 8 feet
☐	89-6-706(a)(4)	Minimum gravel diameter 1-1/2" (one and one half inches)
☐	89-6-706(a)(7)	Turf prohibited on steep park strips
☐	89-6-706(b)	Adopted streetscape plans

Parking lot landscaping

☐	89-6-707	Design standards (note: minimize slope on berms, if used)
☐	89-6-707	Islands in parking areas shall not be sloped or bermed

Landscape standards for specific uses

☐	89-6-708(a)	Single-family and two-family developments
☐	89-6-708(b)	Multi-family developments
☐	89-6-708(c)	Mobile home parks
☐	89-6-708(d)	Business/Research Park Zone (BR-P)
☐	89-6-708(e)	Commercial and Professional Office developments
☐	89-6-708(f)	Manufacturing developments
☐	89-6-708(g)	Downtown overlay zone

Qualifications, Inspections, and Audits

☐	89-6-709(a)	City may require proof of contractor licensure
☐	89-6-709(f)	Applicant notify City when ready for mid-installation irrigation field inspection (before pipes are buried)
☐	89-6-709(b-e)	Irrigation Audit must be passed with 60-70% distribution uniformity before building occupancy is granted.

Cash Bond

☐	89-6-710(a)	Bond required for occupancy if irrigation audit not completed
☐	89-6-710(b)	If exempt from irrigation audit, bond requirements of 89-1-109 (private projects) and 89-6-1202 (public improvements) apply.

Excessive Water Use *(applies to property owners)*

☐	89-6-711(a)	Applies to properties with Landscape Water Allowance described in section 89-6-703(a)(4)
☐	89-6-711(b)	Property owner notified by City when water consumption exceeds 130% of monthly water allowance.
☐	89-6-711(c)	Additional irrigation audit required after four months over 130% of monthly water allowance. Audit fee included in customer utility bill.
☐	89-6-711(d)	Penalty for continued excessive water use
☐	89-6-711(e)	Administrative review. Adjustments allowed for circumstances beyond customer's control.

Minimum Standards for Efficient Landscape Irrigation System Design and Installation

VERSION
2002

Prepared by the
Irrigation Standards Committee of

The Utah Irrigation Association

Introduction:

This Standards document has been provided to assist in promoting efficient irrigation design and installation. Underscored throughout the document is the emphasis on conserving water through modern irrigation practices. This document is subject to revision. Please forwards comments and suggestions to the Utah Irrigation Association.

1. GENERAL SCOPE:

1. Irrigation systems shall be subject to construction and completion inspections as specified by system designer prior to turnover to owner.
2. Irrigation drawings shall include but not limited to zone size, operating pressure and scheduled flow rates.
3. Owner shall be provided a complete scaled as-built drawing upon project completion. Refer to Section 2 "As-Built Drawings."

1.1 SYSTEM CHARACTERISTICS:

1. Design and construction of irrigation system must meet all applicable codes. Components of irrigation system shall be designed and installed in accordance with guidelines set forth by manufacturers.
2. Spray or overhead type systems shall be designed to match/provide efficient watering cycles utilizing E.T has baseline.
3. Systems shall be designed to provide a minimum of 60% Distribution Uniformity (DU) for spray type heads and 70% DU for rotor type heads.
4. Pressure regulation devices will be installed to allow entire system including all remote control valves and all sprinkler heads to operate at optimum pressure designated by product manufacturer. Pressure regulation devices may include one or all of the following: 1—pressure regulation valve at main line POC, 2—pressure regulation device on/at remote control valve, 3—pressure regulation device on individual sprinkler heads. 4- regulation of low volume drip/micro systems.
5. Booster pumps shall be installed on systems where supply pressure does not meet minimum recommended pressures of sprinkler manufacturers.
6. Systems shall be able to complete watering in 10 hours or less per night. (Applies to post established landscapes.)
7. Provide separate zones for turf, shrubs, and drip.
8. Provide separate zones for different exposures. (i.e. north side of building vs. south side)
9. Match appropriate zones for plant material to irrigation.
10. Provide separate zones for sloped areas. When irrigating slopes, take runoff at slope bottom into consideration. Run lateral lines parallel to slope.
11. Systems shall contain check valves to prevent low point drainage where applicable.
12. Provide separate zones for variations in site soil types.
13. Design and/or install with reduced head spacing or low angle nozzles for windy conditions.
14. Each zone shall have its own station on the controller.
15. No single zone shall be designed or installed with sprinklers of differing pressure requirements or precipitation rates. (Rotors, spray heads, drip emitters may not be mixed within a zone.)
16. All sprinkler heads shall be spaced at a maximum of 50% of design performance diameter of the sprinkler. Spacing shall be reduced below 50% of design performance diameter when conditions demand.

17. Irrigation systems with 1" POC or 2500 square feet and larger of landscaped area shall have a master valve installed.
18. The UIA endorses the use of non potable color indicators (equipment) for heads, valves, valve boxes, quick couplers, piping, etc., when irrigation systems are supplied by secondary or other non potable water sources.

1.2 POINT OF CONNECTION:

1. Systems with irrigated area of 1 acre and larger shall have a normally closed master valve. Where necessary, the master valve shall be capable of manual operation to allow manual use of the irrigation system. A normally open master valve is acceptable if the controller is capable to shut the valve off in event of unscheduled flow.
2. Recommended Point of Connection component installation order: 1-connection to source, 2-stop & waste valve/ or shut off, 3-wye strainer, 4-pressure regulator, 5-backflow preventer, 6-quick coupler blowout, 7-master valve, 8-flow meter - (if required).
3. In situations of secondary water supply, provide filtration system necessary to clean water supply and protect irrigation system components. Provide accessible pressure gauges immediately upstream and downstream of the filtration device. (non self cleaning units).
4. The UIA recommends with 11/2" POC systems, an additional/separate water meter be installed for use with the landscape.

1.3 CONTROLLER / WIRE:

1. Controller shall be able to provide separate programs for turf zones, shrub zones, and drip zones.
2. Controllers shall be capable of temporarily shutting down system by utilizing internal/external options (such as rain, wind, freeze devices).
3. Controller shall be programmable for multiple start times for repeat and rest periods, and shall be capable of water budget adjustment.
4. Power wire and control wire shall not be contained in the same conduit.
5. Controller wiring at outside exposure shall be contained in steel rigid conduit. EMT conduit for inside installations.
6. Remote control valve wiring shall be a minimum of 14 gauge, UF UL or PE UL rated.
7. All wire connections shall be made with watertight connectors and contained in valve box.
8. Provide slack/extra control wire at all change in directions.
9. Provide 36" of slack wire at each remote control valve in valve box.
10. Remote control valve wiring shall be installed with the main line pipe where possible, taped to the underside of the mainline pipe at regular intervals.
11. Remote control valve wiring shall have separate colors for common, control, and spare.
12. Provide minimum of one spare wire for every five remote control valves in system. Spare wire shall be available at all valve manifolds or clusters. All spare wires shall be "home run" to the respective controller. End run common.
13. Outdoor controllers shall be lockable and weather resistant.
14. All wiring under hardscaping shall be contained in sleeving.

1.4 PIPING / FITTINGS:

1. All PVC pipe shall be rated ASTM D 1784 or 1785.
2. Minimum recommended standards for PVC pipe: Schedule 40 for sizes 3/4" through 3", Class 200 for sizes 4" and up. ½" PVC pipe not allowed.
3. Maximum flow velocity in any pipe shall not exceed five feet per second. Pressure Polyethylene pipe shall be ASTM D2239 rated, lateral and drip tubing excepted.
4. All piping under hardscape shall be contained in sleeving separate from wire sleeving.
5. All piping will be capable of winterization by air blowout.
6. Manual drains may be used in main line pipe applications.
7. Minimum pipe depths: lateral pipe 12" cover, main line 18" cover, sleeving 18" cover.
8. All piping will be backfilled with clean material, settled and compacted to proper finish grade.
9. All solvent weld joints to be installed according to manufacturer specifications.
10. All insert fittings shall be installed according to manufacturer specifications.
11. PVC Main lines shall use a minimum of Schedule 40 fittings for ¾" through1 1/2". Sch 80 or better 2"-3".
12. Push on ductile or Mechanical cast iron fittings shall be used on PVC main line fittings 4" and larger.
13. Proper thrust blocking shall be installed on all fittings 3" and larger.

1.5 VALVES:

1. Remote control valves shall be sized according to the of the zone demand requirement, lateral piping downstream and manufacturer's specifications.
2. All remote control valves shall have flow control adjustment.
3. Non potable (secondary) systems shall use compatible (dirty water) remote control valves.
4. Control valves will be installed in a Standard or larger, manufactured, valve/meter box, capable of being bolted closed after installation.
5. Remote control valve in valve box shall have ample space for service and to remove valve cover

1.6 SPRINKLER HEADS

1. All sprinkler heads shall be attached to lateral line pipe with a flexible/adjustable swing assembly.
2. Spray heads shall pop up a minimum of 4"in turf areas.
3. Sprinkler heads adjacent to hardscape paving shall be spaced 1 to 3" away from paving. Sprinklers adjacent to walls, buildings, fences or other structures shall be spaced a min. 6" away from structures.
4. All sprinklers within a zone shall have matched precipitation rates.
5. Shrub heads located adjacent to pedestrian areas shall be pop up variety.
6. Sprinklers in turf areas shall be fully spring retractable and pop up a minimum of 4".

2. IRRIGATION AS-BUILT DRAWINGS AND OPERATIONS AND MAINTENANCE MANUALS

2.1 The following shall be included on Irrigation As-Built Drawings. In addition, provide a reduced color-coded drawing(s) showing all zones and assigned valves.

2.2 Note all points of connection (P.O.C.) include tap size, line size and static water pressure (P.S.I.) of service.

2.3 Provide name and phone number of the servicing water purveyor. Include the date the installation was completed and the date the as-built drawing was approved.

2.4 Accurately locate all of the following major components and their size, installed on the project.

a. Water Meters
b. Backflow Preventors
c. Pressure Reducing Valves (note pressure settings)
d. Filters
e. Stop and Waste
f. Master Control Valves
g. Isolation and Gate Valves
h. Flow Sensors
i. Remote Control Valves (note station assignment, size, flow rate, pressure setting. D.U. and actual flow rates if available from water audit)
j. Drip System Pressure Regulators and Filters
k. Quick Couplers and Hose Bibs
i. Pressure Main Lines and Sizes
m. Main Line Sleeves and Sizes
n. Capped Main Lines and Future P.O.C.'s
o. Manual Drain Valves and Sumps
p. Remote Control Wire
q. Controller Location (s) (note manufacturer, model, size and number of stations used)
r. Rain Sensors
s. Moisture Sensors
t. Note and identify location(s) of existing utility systems as encountered during installation i.e. gas, phone, sewer etc.

2.5 Locate the following additional components installed on the project:

a. All Sprinkler Heads
b. Lateral Lines and sizes
c. Lateral Line Sleeves and sizes
d. Manual or Automatic Flush Valves
e. Air Release Valves

2.6 Operations and Maintenance Manual

1. A signed and dated written description of the contractor's warrantee and warrantee period. Include name, address, phone number and license number.
2. A description of system start up and winterization process.
3. All product literature and customer service information for products used/installed on project.

Municipal Code

Title 89, Chapter 6, PART 7. (Landscaping)

City of West Jordan, Utah
Effective July 21, 2005

Sec. 89-6-701. Purpose and scope of part.

(a) *Purpose.* The purpose of this part is to:

(1) require landscaping to visually soften paved areas and buildings;

(2) establish energy conservation and enhanced environmental conditions by providing shade, air purification, noise, glare and heat abatement, and retardation of storm water runoff;

(3) preserve, enhance and expand the urban forest;

(4) buffer uncomplimentary land uses and generally enhance property values and appearance within the City; and,

(5) encourage water conservation through the use of water-conserving plants, efficient irrigation systems, and responsible irrigation scheduling.

(b) *Scope and application.*

(1) These regulations shall apply to new landscapes in all developments within the City except front, side, or back yards of single-family or two-family residences.

(2) Except for single-family residential and two-family dwellings, the landscaping required by this Part shall be provided as a condition of building permit issuance for any building addition, or expansion or intensification of use on a property that increases the floor area and/or parking requirement by 50% or more.

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003)

Sec. 89-6-702. Administrative modifications to landscaping standards.

(a) Requests may be made to the Zoning Administrator for modifications to the standards of this Part. In making the request, the applicant shall present substantial evidence that:

(1) the strict application of applicable standards will result in an unreasonable hardship as the result of shallow lot depth, irregular lot shape, unusual topography or other similar factors; or

(2) the proposed modification constitutes an innovative landscaping design which is superior to the landscaping that would result from strict application of required standards.

(b) The Zoning Administrator shall make any determination to modify landscaping standards in writing, and shall include in the determination the findings upon which it was based.

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003; Ord. No. 04-23, (a), 05-25-2004)

Sec. 89-6-703. Submittal Materials, Fees, and Standards.

(a) *Submittal.* For all development proposals except single-family and two-family dwellings, landscape and irrigation plans, with appropriate details, shall be prepared and submitted by the applicant with the initial application. Landscape and irrigation plans shall also be provided as a condition of building permit issuance for any addition, expansion, or intensification of a property that is noncomplying due to landscaping, or that increases the floor area and/or parking requirement by 50 percent or more. At a minimum, the submittal shall include: Fees, Landscape Plans, Topsoil Analysis, Landscape Water Allowance, and Irrigation Plans.

(1) Fees. Landscape Plan Submittal Fees shall be paid to the City with final plan submittal. The fee revenues shall be used to pay for city staff and/or contractors performing plans reviews, field inspections, and irrigation audits. The Landscape Plan Submittal Fees shall be established by Resolution of City Council. Fees shall apply to landscapes over 1,000 square feet in size.

(2) Landscape Plans. All Landscape Plans shall be prepared by a Landscape Designer, as defined in section 89-1-203, and shall contain the following information.

a. The location and dimensions of all existing and proposed buildings and structures, property lines, easements, parking lots and drives, streets and rights-of-way, sidewalks, signs, dumpster enclosures, fences, and other site features as determined necessary by the Zoning Administrator.

b. The location of all proposed plants and a Plant Schedule specifying the quantity, size, common name, botanical name, and spacing of all proposed plants.

c. Designation of Landscape Zones, as defined in section 89-1-203, grouping plants with similar water needs.

d. The location, size, and common names of all existing plants on the site, including trees and other plants in the parkway, indicating plants to be retained and those that will be removed.

e. The location of existing buildings, structures and plants within twenty feet of the site.

f. Existing and proposed landscape grading of the site indicating contours at two-foot intervals. Proposed berming shall be indicated using one-foot contour intervals.

g. Elevations of all proposed fences and retaining walls on the site.

h. Summary data indicating:

1. the total area and percentage of the site that will be landscaped;

2. the area and percentage of landscaping that will be planted in domestic turf grasses;

3. the percentage of landscaped area coverage from water conserving trees, shrubs, perennials, and groundcover species expected after plant maturity, not including tree canopies. See definition of Water-Conserving plants in section 89-1-203; and

4. the total percentage of landscaped area with actual plant coverage expected after plant maturity, not including tree canopies.

(3) Topsoil Analysis. All plant material shall be compatible with soil conditions, as determined by a Topsoil Analysis. The Landscape Designer shall obtain and provide a topsoil suitability analysis including the following characteristics and quantitative values:

a. Soluble salts (dS/m or mmho/cm)
b. pH
c. Sand (%)
d. Silt (%)
e. Clay (%)
f. Texture Class (sandy clay, clay loam, silty sand, etc)
g. Organic matter (%)
h. % Coarse fragments (>2mm diameter)
i. Sodium Adsorption Ratio (SAR)

Topsoil analysis shall include recommendations for soil amendments. The Landscape Plan shall incorporate any recommendations by the Landscape Designer for soil amendments or preparation based on the Topsoil Analysis.

(4) Landscape Water Allowance. For all landscapes measuring over 1,000 square feet, the Landscape Designer shall prepare annual and monthly Landscape Water Allowances for use after the 60-day plant establishment period, based on the following equations, and copies shall be provided to the City and property owner:

a. Annual Water Allowance (gallons) $= ET_O \times 1.0 \times 0.62 \times A$

where Landscape Water Allowance is in gallons per year, and

ET_O = Reference Evapotranspiration (31.18 inches per year in Salt Lake County)

1.0 = ET_O adjustment factor, 100% of turf grass ET_O (water year adjustment factor)

0.62 = conversion factor (to gallons per square feet)

A = total Irrigated Landscape Area in square feet

b. Monthly Water Allowance (gallons) $= ET_O \times 1.0 \times 0.62 \times A$,

using the following monthly ET_O values:

ET_0 values (inches) for Monthly Water Allowance											
Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
0.00	0.00	0.00	3.36	4.59	5.40	6.21	5.60	3.72	2.30	0.00	0.00

(5) Irrigation plans. When a site is required to be landscaped under the terms of this Part, a permanent irrigation system shall be installed to help insure survival of plants, unless the Landscape Plans specifically indicate that the plants will not require artificial irrigation for establishment or to remain healthy and aesthetically appealing.

All irrigation plans shall be prepared by an Irrigation Designer, as defined in section 89-1-203.

Irrigation Plans shall be drawn at the same scale as the Landscape Plan and shall contain the following minimum information.

a. Layout of the irrigation system and a legend summarizing the type and size of all components of the system, including manufacturer name and model numbers.

b. Static water pressure in pounds per square inch (psi) at the point of connection to the public water supply.

c. Flow rate in gallons per minute and design operating pressure in psi for each valve.

d. Precipitation rate in inches per hour for each irrigation zone.

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003)

e. Preliminary Irrigation Schedule based on flow calculations.

(b) Irrigation Standards

(1) Irrigation systems shall be installed by an Irrigation Contractor, as defined in section 89-1-203.

(2) On slopes exceeding 33 percent, the irrigation system shall consist of Drip Emitters, Bubblers or sprinklers with a maximum average Precipitation Rate of 0.85 inches per hour and the controller clock shall be set with appropriate cycles and run-times to eliminate Runoff.

(3) Each valve shall irrigate a landscape with similar site, slope and soil conditions and plant materials with similar watering needs. Turf and non-turf areas shall be irrigated on separate valves. Each type of irrigation device (drip, bubblers, fixed, rotors, etc) shall be placed on separate valves.

(4) Drip Emitters or a Bubbler shall be provided for each tree. Bubblers shall not exceed 1.5 gallons per minute per device. Bubblers for trees shall be placed on a separate

valve unless specifically exempted by the City due to the limited number of trees on the project site.

(5) Drip irrigation lines shall be installed underneath mulch, except for emitters and where approved as a temporary installation. Filters and end flush valves shall be provided as necessary.

(6) All irrigation systems shall conform to the most current edition of "Minimum Standards for Efficient Landscape Irrigation System Design and Installation" set by the Utah Irrigation Association, which document is hereby adopted and fully incorporated as if set forth in its entirety. Three copies of the "Minimum Standards for Efficient Landscape Irrigation System Design and Installation" have been filed for use and examination by the public in the City Recorder's office prior to its adoption and, thereafter, at least one copy shall be available through the City Recorder's office.

(7) Irrigation systems in City-owned projects, or property to be turned over to the City shall also conform to the City's *Public Improvement Standards, Specifications, and Plans* manual, which document is hereby adopted and fully incorporated as if set forth in its entirety. Three copies of the *Public Improvement Standards, Specifications, and Plans* manual have been filed for use and examination by the public in the City Recorder's office prior to its adoption and, thereafter, at least one copy shall be available through the City Recorder's office.

(8) Landscape Water Meter. A separate water meter shall be installed for landscape irrigation systems that are used in projects with landscaped area over 1,000 square feet in size. The landscape water meter shall be separate from the water meter installed for indoor uses. The size of the meter shall be determined based on irrigation demand. The landscape water meter shall not be a "sub-meter," but shall be billed separately from any indoor meters.

Sec. 89-6-704. Landscaping for water conservation.

(a) Landscape designs for sites in West Jordan shall recognize the climatic limitations of the Salt Lake Valley and the need for water conservation. For this reason, the following criteria shall be used in evaluating all Landscape Plans.

(1) Trees, shrubs. Not less than 80% of trees and shrubs specified on the Landscape Plan shall be water-conserving species that can withstand dry conditions once established. The plant list titled "Water-Wise Plants for Salt Lake City," is designated as the primary reference in determining qualifying plants, which document is hereby adopted and fully incorporated as if set forth in its entirety. Three copies of the "Water-Wise Plants for Salt Lake City" document have been filed for use and examination by the public in the City Recorder's office prior to its adoption and, thereafter, at least one copy shall be available through the City Recorder's office.

(2) Herbaceous perennial and groundcover plants. Not less than 80% of herbaceous perennial and groundcover plants specified on the Landscape Plan shall be drought-tolerant species that can withstand dry conditions once established. The plant list titled "Water-Wise Plants for Salt Lake City," is designated as the

primary reference in determining qualifying plants.

(3) Turf grasses. If turf grasses are selected for use on a site, they shall not comprise more than 50% of the total landscaped area. Use of water conserving grasses, such as Buffalo Grass, Blue Gramma grass, varieties of Dwarf Tall Fescue, or equivalent are encouraged. Turf grasses shall only be used in areas where the grade of the site is 30% or less in order to prevent the runoff of irrigation water.

Exception: Turf areas designed for active recreation at parks, schools, storm drain detention basins, and golf courses are exempt from this provision.

(4) Irrigation systems. While irrigation systems are necessary for certain landscape areas, and may be desirable for other applications, all irrigation systems shall be designed for the most efficient use of water, as outlined in section 89-6-703.

(5) Water features. Water features can provide relief from summer temperatures, but should be used sparingly with every attempt made to limit the amount of water used. Fountains and other water features should be sited and designed so that they are, and also appear to be, efficient users of water. Water features should also be designed to maximize the amount of water recycled and to minimize the amount of make-up water required. This should be accomplished through proper design of the catch basin of the water feature and, where there is a significant risk of over-spray, wind shut-off valves should be incorporated into the system.

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003)

(6) For projects located at the interface between urban areas and natural open space, Water-Conserving Plants shall be selected that will blend with the native vegetation and are fire resistant or fire retardant. Plants with low fuel volume or high moisture content shall be emphasized. Plants that tend to accumulate excessive amount of dead wood or debris shall be avoided. See definition of Water-Conserving Plants in section 89-1-203.

(7) Slopes. Areas with slopes greater than 30% shall be landscaped with deep-rooting, Water-Conserving Plants for erosion control and soil stabilization. See definition of Water-Conserving Plants in section 89-1-203.

(8) Plant Coverage. Plants shall cover 10% or more of the required landscape area, not including tree canopies.

(9) Rock and Gravel. When used in portions of landscaped areas, rock and gravel shall measure a minimum of 1-1/2" (one and one-half inches) in diameter or larger.

Sec. 89-6-705. Design, installation, maintenance, and irrigation scheduling.

(a) *Design guidelines.*

(1) Scale and nature of plants. The scale and nature of plants shall be appropriate to the size of the structures. Large scaled buildings, for example, should generally be complemented by larger scaled plants.

(2) Selection of plants. Plants shall be selected for form, texture, color, pattern of growth and adaptability to local conditions. All plants shall be of good quality and capable of withstanding the extremes of individual site microclimates.

(3) Evergreens. Evergreens should be incorporated into the landscape design, particularly in those areas where screening and buffering is required.

(4) Softening of walls and fences. Plants shall be placed intermittently against long expanses of building walls, fences, and other barriers to create a softening effect.

(5) Detention/retention basins and ponds. Site drainage and detention facilities shall be integrated into the overall landscape design as usable open space. Detention/retention basins and ponds shall be landscaped. Such landscaping may include shade and ornamental trees, evergreens, shrubbery, hedges, turf, groundcover and/or other plants.

(6) Energy conservation. Plant placement shall be designed to reduce the energy consumption needs of the development.

a. Deciduous trees should be placed on the south and west sides of buildings to provide shade from the summer sun.

b. Evergreens and other plant materials should be concentrated on the north side of buildings to dissipate the effect of winter winds.

(7) Preservation of existing plants. Existing mature trees and other significant vegetation shall be incorporated into the landscape design. Trees in the public right-of-way shall not be removed without the approval of the Urban Forester. Existing trees that are preserved and incorporated into a new landscape plan may be credited toward the minimum number of trees required as specified in Section 89-6-708 for each zoning category. In order to receive this credit, existing trees shall be a minimum of two-inch caliper DBH (diameter at breast height or 4.5 feet from ground) for both deciduous and coniferous trees. All existing trees receiving this credit shall be healthy and free of mechanical injury.

(8) Landscape berms. Berms and existing topographic features should be incorporated into the landscape design to provide interest and, where necessary, should be used in combination with plants to help provide screening and buffering as required elsewhere in this Title. The slope of berms shall not exceed 25% (a ratio of four horizontal feet to one vertical foot).

(9) Above-ground utilities. The landscape design shall identify the location of above-ground public utilities (i.e., overhead power lines, transformers, meter boxes, backflow preventers, etc.) and offer design solutions to mitigate the visual impact of such elements on the site while not obstructing access to such facilities for maintenance and service.

(10) Sign visibility. Although landscaping may not initially appear to obscure a sign, it may significantly reduce or eliminate the sign's effectiveness unless taken into account in the planning stage. Selection and placement of plants in the vicinity of signs should be determined by the mature height and spread of the plants to insure that signs are not obscured from view when the landscape has reached full maturity. Plant foliage shall not obscure in any way complete visibility of public safety and traffic regulatory signs.

(b) *Installation.*

(1) Plant size. Size and density of plants at the time of planting and at maturity shall be considered when approving Landscape Plans. The following minimum size standards shall apply.

a. Deciduous trees. All deciduous trees shall have a minimum trunk size of two inches in caliper (measured at six inches above root flare or at soil/ground level).

b. Evergreen trees. All evergreen trees shall have a minimum height of five feet.

c. Shrubs. All shrubs shall have a minimum height or spread of 18 inches depending on the plant's natural growth habit. Plants in five-gallon containers will generally comply with this standard.

d. Ground cover.

1. Crowns, plugs or containers shall be in a number sufficient by species to provide 10 percent surface coverage after two growing seasons.

2. Turf and native grass. Seeding shall provide complete coverage within the first growing season.

3. Sod. The amount of sod shall be the amount necessary to provide coverage and soil stabilization.

(2) Approved street trees. Street trees shall be selected from the *City of West Jordan Approved Street Tree Lists* found in Chapter 7 of the City's *Public Improvement Standards, Specifications, and Plans* manual.

(3) Planting. All landscaping shall be installed in accordance with the current planting procedures established in the City's *Public Improvement Standards, Specifications, and Plans* manual. All planting shall be completed within one year from the date a final Landscape Plan is approved.

(4) Mulch. A four inch layer of mulch shall be applied to all planting beds to inhibit weed growth and conserve soil moisture. Mulch shall not be used as a substitute for plants. Non-porous materials shall not be placed under the mulch. Mulch shall not be required around plant varieties that may be harmed by mulch.

(5) Soil Preparation. Soil preparation shall be suitable to provide healthy growing conditions for the plants and to encourage water infiltration and penetration. Soil preparation shall include scarifying the soil to a minimum depth of six (6) inches and amending the soil with organic material as per specific recommendations of the Landscape Designer based on the Topsoil Analysis.

(c) *General landscape maintenance.*

(1) Responsibility. The developer, his successor, and/or subsequent owners of a site for which landscape plans were required shall be responsible for the maintenance, repair and replacement of all landscaping elements.

(2) Landscape plants. All landscape plants shall be maintained in good condition so as to present a healthy, neat and orderly appearance. Plants not in this condition shall be replaced when necessary. Landscaped areas and shall be kept free of refuse and debris.

(3) Irrigation systems. Irrigation systems shall be maintained and adjusted at least monthly, or per owner's manual, in order to ensure optimal operating condition and to promote water conservation.

(4) The owners of phased developments shall implement a program for dust, weed and debris control on undeveloped portions of the site.

(d) *Tree maintenance.*

(1) Clearance under trees.

a. Trees adjacent to pedestrian walkways shall have a minimum canopy clearance of eight feet above grade.

b. Tree canopies that extend over street travel ways shall be pruned to provide canopy clearance of at least 15 feet above street pavement.

(2) Pruning. It shall be unlawful for any person to do any major pruning (20 percent of more), to top or prune the crown, or remove any street tree or tree on commercial property without first obtaining approval from the City's Urban Forester. City personnel shall also receive permission for removal of any public tree. The Urban Forester must approve the removal of any public tree. As a condition of such approval, the permittee may be required to replace the tree.

(3) Protection of trees. Any public tree located in the immediate vicinity of any excavation, demolition or construction site which has potential for injury, shall be protected from such injury unless the contractor has received approval from the Urban Forester to remove the tree(s).

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003; Ord. No. 04-23,(a)(7); (b)(1) and (d)(7), 05-25-2004)

(e) *Irrigation Schedules.*

1. An irrigation audit shall be performed and two Recommended Irrigation Schedules shall be prepared by the Irrigation Auditor. Sprinkler run times shall be calculated based on the precipitation rate measurements in the final audit report. For zones not audited, estimated precipitation rates shall be based on flow calculations. The first schedule shall cover the initial 60-day plant establishment period. The second schedule shall cover the post-establishment period. Copies of these schedules shall be provided to the City, property owner,

and business owner. Both the establishment and post-establishment irrigation schedules shall be posted visibly near the irrigation controller and include the following information for each valve:

a. Station (valve) number

b. Plant Type

c. Sprinkler Type

d. Precipitation Rate (inches per hour)

e. Minutes required for appropriate watering depth

f. Cycles and Run times (minutes per cycle) to avoid runoff

g. Irrigation Intervals (days between waterings) based on plant material, soil type, and the seasonal fluctuations in water demand. The following seasonal intervals may be used as a general guide, but may be adapted as needed:

Month	**Apply ½" of water once every:**
January	No irrigation
February	No irrigation
March	No irrigation
April	6 days (if needed)
May	4 days
June	3 days
July	3 days
August	3 days
September	6 days
October	10 days (if needed)
November	No irrigation
December	No irrigation

2. Valves with fixed or rotor sprinklers shall be scheduled to operate between 6 p.m. and 10 a.m. to reduce water loss from wind and evaporation.

3. Valves shall be programmed for multiple repeat cycles where necessary to reduce runoff, particularly on slopes and soils with slow infiltration rates.

Sec. 89-6-706. Park strips and streetscapes.

(a) *Park strips.* Park strips are defined as the area within a street right-of-way located between the back of curb (or edge of pavement if there is no curb) and the sidewalk or, if there is no sidewalk, the back of curb and the right-of-way line.

(1) Intent. The intent of these park strip landscaping standards is to maintain the appearance of park strips, protect the users of park strips by prohibiting the use of materials that may cause harm or injury to pedestrians or vehicles, provide for safe and convenient access across park strips to and from vehicles that may park at the curb, increase landscape design flexibility while not unreasonably inhibiting access for repair and maintenance of public utilities, encourage water conservation through the use of water-conserving plants, and to generally improve environmental conditions along the City's streets. See definition of water-conserving plants in section 89-1-203.

(2) Park strip trees.

a. Spacing and size. Park strip trees, when required, shall be provided at the equivalent of at least one tree for each 30 feet of street frontage and may be clustered or spaced linearly as deemed appropriate by the Urban Forester. Trees size shall be a minimum of two inch caliper (measured at six inches above root flare or at soil/ground level) at time of planting.

b. Tree grates. If new trees are proposed in a park strip in which the area surrounding the tree will have an impervious service, tree wells with grates shall be provided which comply with the City's *Public Improvement Standards, Specifications, and Plans* manual

c. Approval and planting. No tree shall be planted in a park strip without first obtaining approval from the Urban Forester. Tree species and planting location shall be approved by the Urban Forester.

d. Tree maintenance. Planting and maintenance of trees shall be done in conformance with the City's *Public Improvement Standards, Specifications, and Plans* manual. No work (pruning, removal, etc.) shall be performed on street trees without first obtaining approval from the Urban Forester.

(3) Park strip ground surface treatment.

a. Plant coverage. Plants in park strips, not including tree canopies, shall cover 10% or more of the park strip surface within three years of planting or when planting has reached maturity, whichever comes first. For lots with two or more street frontages, this standard shall be applied separately to each adjacent park strip on each street frontage. In new park strips, or when replacing landscaping in existing park strips, water-conserving plants, as defined in section 89-1-203, shall constitute at least 80% of all plants used

Exception: The percentage of vegetation coverage may be modified or waived as part of the approval of a master streetscape plan for a development.

b. Shrubs and annual or perennial flowering plants. Shrubs and annual or perennial flowering plants, up to 36" in height, are permitted as

individual specimens or accent plants when not located within site distance areas. Shrubs shall not be planted at a spacing that would result in a visual barrier between the street and sidewalk. If the entire park strip is planted with annual or perennial flowering plants, it shall be the property owners responsibility to insure that erosion does not deposit soil or other material on sidewalks or in the street.

c. Organic mulch. Materials such as bark, shredded plant material, and compost, may be used as water-conserving mulch for plants and may also be used as the only material in portions of a park strip.

d. Parking strips and other landscaped areas less than eight (8) feet wide shall not be irrigated with pop-up fixed or rotor sprinklers. These areas shall generally be landscaped with water-conserving plants or approved street trees irrigated with micro-spray, bubblers, or drip irrigation. Street tree requirements in section 89-6-706(2) apply. Turfgrass may only be used in these areas if irrigated with surface bubblers or sub-surface systems.

(4) Gravel, Rocks, and Boulders. Gravel, rocks, and boulders, may be used on portions of the park strip. Large diameter rocks and boulders shall be kept a minimum of 18" away from existing street trees. Gravel and rocks shall measure a minimum of 1-1/2" in diameter or larger. Vegetation, organic mulch, or gravel shall be used near existing street trees.

(5) Paving Materials. Paving materials, limited to poured concrete, concrete pavers, brick pavers, or natural stone pavers, may be used in portions of a park strip subject to the following limitations.

a. Paving Materials Near Existing Street Trees. Poured concrete shall not be placed in any park strip with existing street trees. Other paving materials shall be kept a minimum of 18" away from existing street trees. Organic mulch or gravel, as approved by the Urban Forester, shall be used near existing street trees.

b. Park Strips 36" or less in width. Except as specified in Section 89-6-706(a)(5)a. above, any paving material may be used in 100% of a park strip that is 36" or less in width. If poured concrete it used, it shall be finished with a stamped pattern resembling brick or natural stone or scored with another decorative pattern to distinguish it from the adjacent sidewalk.

c. Park Strips Over 36" Wide. In park strips over 36" in width, the combination of all brick, stone or concrete pavers, poured-in-place concrete, organic mulch used without plants, gravel, rocks, and boulders shall not exceed 90% of the total park strip surface area. Poured concrete shall not be used except for carriage ways as outlined below.

(6) Carriage Ways. In order to provide for safe and convenient access across park strips to and from vehicles that may park at the curb, carriage ways (walkways

between the curb and sidewalk) through planted areas are encouraged. The material of carriage ways may be poured concrete, concrete pavers, brick pavers, or flat, natural stone paving materials such as flagstone or a combination of these materials. If poured concrete is used, the carriage way shall be not more than four feet in width and shall be located so as to provide the most direct route from the curb to the sidewalk. The area of carriage ways shall be included in calculating the percentage of inorganic material in the park strip.

(7) Prohibited materials. Materials prohibited in park strips include asphalt, thorn-bearing plants, shrubs which create visual barriers, and structural encroachments. These materials are prohibited for the reasons stated below:

a. Asphalt. Asphalt is inconsistent with the city's urban design policy, and deteriorates quicker than pavers. Asphalt in park strips also reduces roadway access definition and encourages people to drive over the curb.

b. Thorn-bearing plants. Plants which have thorns, spines, or other sharp, rigid, parts are hazardous to pedestrians and bicyclists, and are difficult to walk across.

c. Continuous shrub or perennial plantings that exceed 36" in height at maturity. Continuous perennial or shrub plantings that exceed 36" in height at maturity are hazardous to pedestrians, pets, children on riding toys, and vehicles due to sight distance problems, are difficult to walk across, create visual barriers which promote crime, and limit access to the sidewalk from vehicles parked adjacent to the park strip.

d. Retaining walls, fences, steps, and other similar structural encroachments. Retaining walls, fences, steps, and other similar structural encroachments in park strips are prohibited unless they are specifically approved by the City. These structural encroachments are generally prohibited because they limit access from the street to sidewalks and create obstructions to, and increase the cost of, performing maintenance of public improvements and utilities within the park strip.

e. Plants within clear vision areas. No plants, boulder, monument, or other object which is over 36" in height shall be planted or located within clear vision areas. Street trees shall not be located closer than 30 feet to the projected intersection of curb lines.

f. Turf on steep park strips. Turf is not permitted in park strips with a slope greater than 3:1 (three feet horizontal distance to one foot vertical distance) due to increased runoff of irrigation water from steep slopes.

(8) Park strip maintenance. Any owner of property abutting City park strips shall have the following responsibilities.

a. Regular irrigation based on schedules prepared by irrigation designer and/or auditor, and fertilization of street trees and other vegetation when necessary to maintain good health and vigor.

b. Protection of street trees against damage caused by excessive pruning, lawn mowers, weed trimmers, snow blowers and similar equipment. It is recommended that trees be protected by removing all plant material from at least a two-foot radius around the trunk of the tree and replace with mulch.

c. It shall be unlawful for any private-property owner or tenant to remove any tree in park strips or within the landscape-setback area where there is no park strip without approval from th4e City.

d. Park strips shall be kept free of weeds, refuse, and debris.

(b) *Adopted streetscape plans.* A streetscape plan is required in those cases where a wall is required between a development and an arterial or major collector street. The plan shall show in detail the landscape treatment of the space between the wall and the street curb line.

(1) Where an adopted streetscape plan is in place, the developer shall follow such plan.

(2) Where no adopted streetscape plan is in place, the developer shall coordinate with, and receive approval from, the Urban Forester on development of a streetscape plan and on the installation of the irrigation system and plant materials.

(3) Where the required streetscape is a component of residential development, the landscaping requirement may be satisfied by providing funding to the City to complete the landscaping in accordance with an adopted streetscape plan.

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003; Ord. No. 04-23, (a)(2); (b)(3), 05-25-2004)

Sec. 89-6-707. Parking lot landscaping.

(a) *Parking lot landscaping.* Landscaping within parking areas is required in order to break up the large expanses of pavement and to provide relief from reflected glare and heat, as well as to guide vehicular and pedestrian traffic. Parking lots having more than 15 spaces shall include landscaping as specified below.

(1) Interior parking lot landscaping. Not less than six percent of the interior of a parking lot shall be landscaped. The interior area of a parking lot for the purpose of this computation may be calculated by multiplying the number of parking spaces times 290 square feet. Planting that is required along the perimeter of a parking lot shall not be considered as part of the interior landscaping requirement. Interior parking lot landscaping shall be reasonably dispersed throughout the parking lot.

(2) Perimeter parking lot landscaping. Where a parking lot is located within a required yard, or within 20 feet of a lot line, landscaping shall be provided around the perimeter of the parking lot. The perimeter landscaping shall be not less than eight feet in width.

(3) The minimum interior dimensions of any planting area or planting median shall be eight feet.

(4) Each planting area shall be protected by concrete vertical curbs. Where such curbs serve as a wheel stop for parking spaces, not less than 36 inches shall be provided in the planting area as overhang clearance for tree locations.

(5) No shrubs, perennials, fence, wall or similar item more than three feet in height shall be placed at points of parking lot ingress or egress or in clear vision areas. Trees may be planted in clear vision areas but must be pruned to provide a minimum canopy clearance of eight feet to lowest branches of the tree.

(6) The primary landscaping materials used in parking lots shall be trees that will have a canopy spread of 20 feet or more at maturity. Shrubs, hedges and other plants may be used to complement trees but shall not be the sole landscape element. Effective use of earth berms and existing topography is also encouraged as a component of the landscaping plan. If used, earth berms shall have the least possible slope to prevent irrigation runoff and erosion.

(7) In those instances where plants exists on a parking lot site prior to its development, such plants may be used if approved by the Planning Commission.
(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003)

(8) Landscaped islands within parking areas shall not be sloped or bermed (to prevent runoff and erosion, and to reduce maintenance and debris in the parking areas.)

Sec. 89-6-708. Landscape standards for specific uses.

(a) *Single-family and two-family developments.*

(1) Front yard and side corner yard landscaping. All areas on residential lots located between the front lot line and the main building and between the main building and the lot line of a corner side yard of a corner lot, except driveways, parking areas, walkways, utility areas, approved decks, patios and porches, shall be maintained with suitable landscaping of shrubs, at least two trees, groundcovers, perennials, other landscaping materials, and/or decorative paving. The two required trees may be planted in the yard areas described above or in the park strip abutting the street. The use of water conserving plants is encouraged. See definition of water-conserving plants in section 89-1-203. Landscaping shall be completed within one year after occupancy of the home.

(2) Vegetation coverage. Plants in residential landscapes, not including tree canopies, shall cover 50% or more of the yard area within three years of planting or when planting has reached maturity, whichever comes first.

(b) *Multiple-family developments.*

(1) Landscape coverage. Landscaped areas shall comprise not less than 40% of a multiple-family site. The minimum front yard(s) and side yard(s) adjacent to public streets, except those portions devoted to driveways and sidewalks, shall be landscaped

using trees and other vegetation, as allowed by section 89-6-704.

(2) Required tree planting.

a. Street trees. One tree per 30 linear feet. of street frontage

b. Remainder of site. Trees shall be provided according to following schedule:

Units	Number of Trees
2	2
3 to 8	2 plus one tree for every two units over 2
9 to 20	5 plus one tree for every three units over 8
21 to 40	9 plus one tree for every four units over 20
41 to 60	14 plus one tree for every four units over 40
61' to 100	19 plus one tree for every four units over 60
Over 100	30 plus one tree for every four units over 100

(3) Landscaped buffers. When any multi-family development is proposed adjacent to an existing lower density residential development, a landscaped buffer not less than 20 feet in width shall be required. A minimum of one tree for each 400 square feet , or fraction thereof, of the landscaped buffer shall be planted. These trees shall be in addition to those required by Section 89-6-708(b)(2) above.

(c) *Mobile home parks.* The following landscaping provisions shall apply in all mobile home parks:

(1) Street trees shall be planted along the frontage of all private or public streets within the development and around the periphery of a mobile home park at a minimum spacing of 30 feet on center.

(2) All open areas except driveways, parking areas, walkways, utility areas, decks, patios, or porches shall be landscaped in accordance with section 89-6-704, or as otherwise approved by the Planning Commission. This required landscaping shall include a minimum of one tree per dwelling unit.

(d) *Business/Research Park Zone (BR-P)*

(1) Landscape coverage. Landscaped areas shall comprise not less than 25% of the site. The front yard and side yards adjacent to public streets, except those portions devoted to driveways and sidewalks, shall be landscaped using trees and other plants.

(2) Street trees. Street trees shall be planted at 30 foot intervals no farther than 20 feet from the top back-of-curb and no closer than 15 feet from the top-back-of-curb. These trees may be included among the required trees on the site. Street tree species shall be selected from the *City of West Jordan Approved Street Tree*

Lists found in Chapter 7 of the City's *Public Improvement Standards, Specifications, and Plans* manual.

(3) Landscape standards for remainder of site.

a. Generous treatments of evergreen and deciduous trees, shrubs, flowers and other ground covers shall be required in creating a park-like setting with attractively and functionally designed berms, swales and detention areas. If used, earth berms and swales shall have the least possible slope to prevent irrigation runoff and erosion.

b. A minimum of 20 trees per acre shall be planted. A minimum of 40 percent of the total number of trees shall be evergreen trees.

c. A minimum ten-foot wide landscaped area shall be installed around buildings except in areas used for pedestrian and vehicle access.

d. Plant sizes shall conform to standards specified in Section 89-6-705(b)(1).

e. Landscape buffers may be required in areas that abut incompatible land uses or as visual barriers around parking and utility areas.

f. Landscaped islands shall be located at the ends of parking rows. Islands shall measure a minimum of six feet wide and shall extend the length of the parking stall. A minimum six-foot-wide planter strip shall divide each double parking row and connect the end islands of each row. Deciduous shade trees shall be planted at 30-foot intervals along the length of each parking row to reduce glare, heat and noise.

(e) *Commercial and Professional Office developments.*

(1) Landscape coverage. Landscaped areas shall comprise not less than 15% of a commercial or professional office site. The front yard and side yards adjacent to public streets, except those portions devoted to driveways and sidewalks, shall be landscaped using trees and other plants as allowed by section 89-6-704.

(2) Required tree planting.

a. Street trees. One tree per 30 linear feet of street frontage.

b. Remainder of site. One tree per 3,000 square feet of landscape area.

(3) Landscaped buffers. When any commercial or office development is proposed adjacent to a existing residential development, a landscaped buffer not less than 20 feet in width shall be required. A minimum of one tree for each 400 square feet , or fraction thereof, of the landscaped buffer shall be planted. These trees shall be in addition to those required by Section 89-6-708(e)(2) above.

(f) *Manufacturing developments.*

(1) Landscape coverage. Landscaped areas shall comprise not less than 10% of a manufacturing site.

(2) Required tree planting.

a. Streetscape. One tree per 30 linear feet. of street frontage.

b. Remainder of site. One tree per 4,000 square feet of landscape area.

(3) Other landscaping provisions. Front yard and side yard setbacks adjacent to a public street, except those portions devoted to driveways, shall be landscaped and shall include trees and other landscaping materials. The use of water conserving plants in these areas shall comply with section 89-6-704. See definition of water-conserving plants in section 89-1-203.

(4) Landscaped buffers. When any manufacturing development is proposed adjacent to an existing residential development, a landscaped buffer not less than 20 feet in width shall be required. A minimum of one tree for each 400 square feet , or fraction thereof, of the landscaped buffer shall be planted. These trees shall be in addition to those required by Section 89-6-708(f)(2) above.

(g) *Downtown Overlay Zone*

(1) All landscaping along major streets shall be of a similar type and appearance to create visual distinction in the downtown overlay zone.

(2) Development credits may be provided in the Downtown Overlay Zone to encourage a more user-friendly view from streets or walkways. If additional landscaping is provided that is greater than that required in the underlying zone, the development may qualify for additional density, square footage, or City assistance.

(Enacted by Ord. No. 03-40, 07-15-2003 [Repealed] Enacted by Ord. 03-33, 08-19-2003)

Sec. 89-6-709 Qualifications, Inspections, and Audits

(a)The City may require proof of state licensure and any other qualifications outlined in the definitions within section 89-1-203.

(b) Irrigation Audit. Applies to all landscapes measuring over 1,000 square feet. Following construction and prior to issuing the approval for occupancy, an Irrigation Audit shall be conducted by an Irrigation Association Certified Landscape Irrigation Auditor (CLIA) who is approved by the City. The auditor shall be independent of the contractor, design firm, and owner/developer of the project. The Irrigation Audit will verify that the irrigation system complies with the minimum standards required by this ordinance. The average distribution uniformity for all tested turf zones must be at least 60% for fixed/spray zones and 70% for rotor/stream zones. All turf zones (valves) shall be tested for distribution uniformity, up to a maximum of eight (8) zones. When the

irrigation system consists of more than eight (8) zones, the auditor shall select and test eight (8) turf zones, including both fixed and rotor zones which are most representative of the system. All other zones, including drip irrigation, micro-spray, bubblers, or other designs, shall be turned on and inspected visually for head placement, head adjustment, appropriate gallon-per-minute emitters, pressure problems, leaks, and general coverage.

(c) When the above audit is required, the auditor shall furnish a report to the City and owner/developer certifying compliance with the minimum requirements. Compliance with this provision is required before the City will issue the certificate of occupancy.

(d) The property owner shall complete any changes, upgrades, or re-installations needed to comply with City codes. The owner shall pay the Landscape Plan Submittal Fee each time a new inspection or audit is performed by the Irrigation Auditor.

(e) A Certificate of Occupancy shall not be granted prior to completion of an Irrigation Audit (if required by this chapter), field inspection, and issuance of a Certificate of Substantial Completion.

(f) The City or its contractors may perform site inspections at any time before, during or after the irrigation system and landscape installation, and will require corrective measures if requirements of this chapter are not satisfied. Failure of the City to perform such inspection shall not be a waiver of enforcement of the requirements of this chapter.

Sec. 89-6-710 Cash Bond

(a) If the property owner desires to occupy the building or premises before the irrigation audit and landscape field inspection are complete, a cash bond or other approved financial instrument shall be made with the City according to Section 89-1-109 (private projects) and 89-6-1202 (public improvements). The cash bond or other approved financial instrument shall be released when the required Irrigation Audit and landscape field inspection are successfully completed.

(b) If property is exempt from the Irrigation Audit because landscaped area measures less than 1,000 square feet, all requirements of Section 89-1-109 (private projects) and 89-6-1202 (public improvements), and applicable requirements of this chapter must be met prior to bond release.

Sec. 89-6-711 Excessive Water Use

(a) Applicability. Applies to properties with Landscape Water Allowance described in section 89-6-703(a)(4).

(b) Notification. Water consumption records shall be monitored monthly by the City's Water Conservation Technician, or other City employee. Each month in which a customer's water consumption exceeds 130% of the monthly Landscape Water Allowance, the City shall notify the property owner by mail, summarizing monthly allowance and actual water consumption data. Upon receipt of such notification, the property owner shall inspect the irrigation system and attempt to bring water consumption within the Monthly Allowance. The appropriate City employee shall provide information or a reasonable amount of on-site assistance to help identify problems with the irrigation system or controller.

(c) Additional Audits. If a customer's water consumption exceeds 130% of the Monthly Allowance as determined by section 89-6-703(a)(4) during four (4) separate months during any calendar year, an Irrigation Audit shall be performed by a City-approved landscape Irrigation Auditor, at the property owner's expense, to determine if the water allowance should be adjusted and locate any leaks, maladjusted sprinkler heads, design flaws, or scheduling changes that should be made in order to meet the Monthly Allowance. The fee for this additional audit shall be the same amount that was paid for the original Landscape Plan Submittal Fee prior to the initial Building Department approval, and shall be included in the customer's utility bill. The fee shall not be required if the auditor determines that the customer's original water allowance was unfairly calculated.

(d) Penalty. If a customer's water consumption continues to exceed 130% of the Monthly Water Allowance after the additional audit described above, a penalty of $500 shall be added to the customer's utility bill for each month that water consumption exceeds 130% of Monthly Water Allowance. After water consumption falls below the 130% threshold for two consecutive months during the normal irrigation season (April-October), any subsequent violations of the 130% threshold shall be considered a new penalty cycle beginning with Notification as described in section 89-6-711(b).

(e) Administrative Review. Within 30 days of receipt of penalty notification, a customer may request an administrative review by the City Manager or designated representative. The request shall include evidence that the excessive water use was due to circumstances beyond the customer's control. The City Manager or designated representative shall review the request and state the final determination within 30 days. The City Manager or designated representative may reduce or reverse the penalty if it is determined that excessive water use was beyond the customer's control.

MEMORANDUM

COMMUNITY DEVELOPMENT DEPARTMENT
Planning Division

TO: Parks, Recreation and Open Lands Committee
FROM: Richard E. Lewis, City Planner
DATE: February 9, 2006
SUBJECT: Trail, Drainage, & Wildlife Corridor Standards

Background:

The City's adopted Parks, Recreation and Trails Master Plan establishes goals and policies for trail development in the City. The Goal Statements are:

1. Provide a comprehensive trail system is West Jordan.
2. Support implementation and extension of the citywide network through the land development, transportation infrastructure development process, and road construction projects.
3. Facilitate trail development with the use of diverse funding sources and partnership opportunities.
4. Promote use of trails as an alternative transportation mode.

The Master Plan contains a proposed master trail plan showing the location of future equestrian trails, multi-use trails, bike lanes and multi-use/equestrian trails. The Plan, however, does not provide details for the actual design and width of these trails.

Fortunately, the City has had several studies completed over the years that provide recommendations for preserving corridors throughout the City for trails, natural drainage channels and wildlife corridors. Those studies include:

a. Barney's Creek Greenway – Trail System Study
b. West Jordan Open Land Plan
c. Wildlife Evaluation of the West Jordan Open Lands Corridors

These studies provide recommendations for the desired width of open corridors for wildlife habitat and design criteria for various types of trail systems. At least three types open space functions have been identified that can be accommodated along stream corridors and along canals. Those are:

1. Multi-Use Trail – Pedestrian
2. Multi-Use Trail – Pedestrian and Equestrian
3. Natural Habitat Greenway

To date, the open areas dedicated for future trail systems along our stream corridors have ranged from about 50 feet to over 800 feet in width depending on flood plain conditions. The average width of corridors, however, appears to be about 100 feet. The Planning

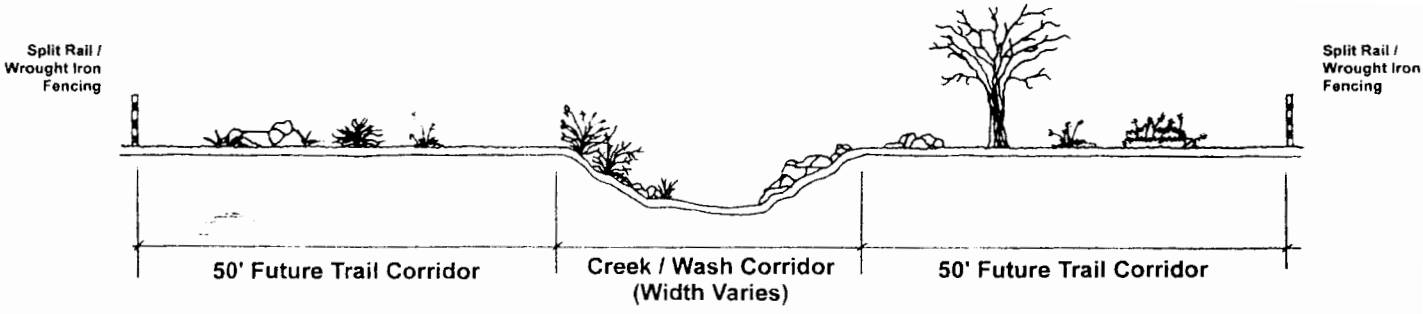
staff has prepared recommendations for the cross-section width for the various types of desired corridors. Once the cross-sections, including standards for trails, buffers, and waterways are completed, they should be adopted as part of the City's Parks, Recreation and Trails Master Plan as well as in the Official Public Improvement Standards, Specifications, and Plans.

The following policy decisions, however, will need to be addressed as part of the adoption of these standards:

1. What portion of the stream corridor outside the actual waterway should be required to be dedicated to the City as part of new subdivisions?
2. Should the developer be required to install the trails and other improvements as part of the subdivision process?
3. How will the long-term maintenance of trails and landscaping be managed?
4. Will the developer be required to pay for the corridor enhancements or will they be reimbursed for this cost?
5. Is it desirable to design these corridors as wildlife corridors with proper habitat or is the long-term function of the corridors an urban trail system?
6. Should there be some type of residential density bonus given for enhancement of the corridors beyond the minimum requirement?
7. Who installs and maintains needed temporary or permanent irrigation systems in the corridors?
8. What restrictions should be required for use of the corridors? Should they be lighted for nighttime use? Should equestrian and multi-use trails be separated by the streambed or shall they be adjacent to each other?

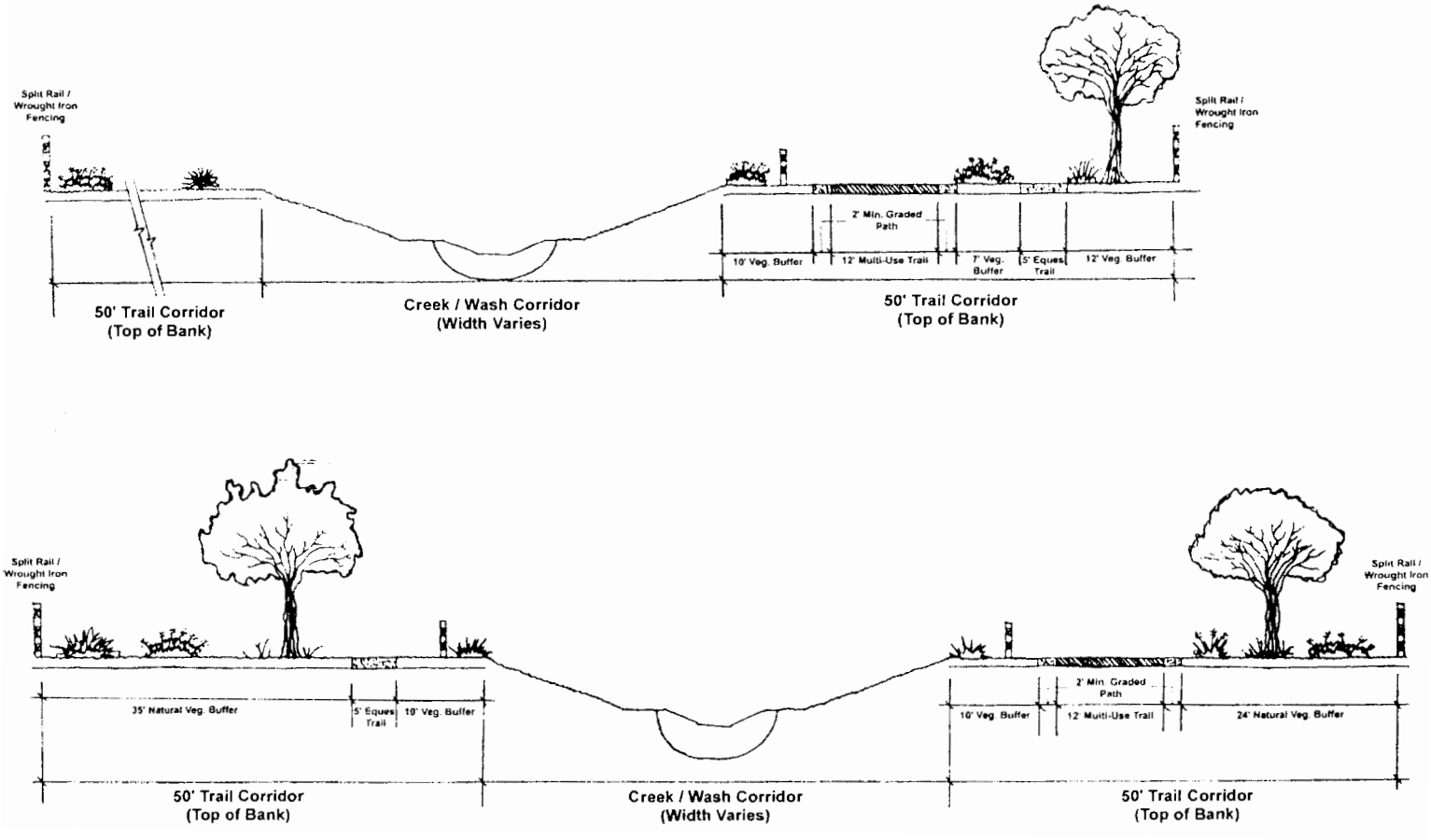
Summary:
There is a great opportunity for the City to create a unique trail system in the western portion of the City as development occurs over the next 10 years. It is critical, however, that standards and policies for the trail program be developed and adopted in the next few months. The studies and Trails Plan have already created the basic framework for the location and type of trails desired and all that is lacking for implementation is the trail design criteria. Perhaps even more important, however, is that policy decisions be made as to the extent of the financial and staff resources to be directed to maintaining a comprehensive trail system. It is unreasonable to expect homeowner associations or developers to maintain the trail systems over the long term. Funding options including a City wide-open space and trail improvement district should be investigated for long term funding sources.

Recommendation:
Review the proposed trail and corridor cross sections as well as the policy issues identified and make recommendations for consideration by the Planning Commission and City Council.

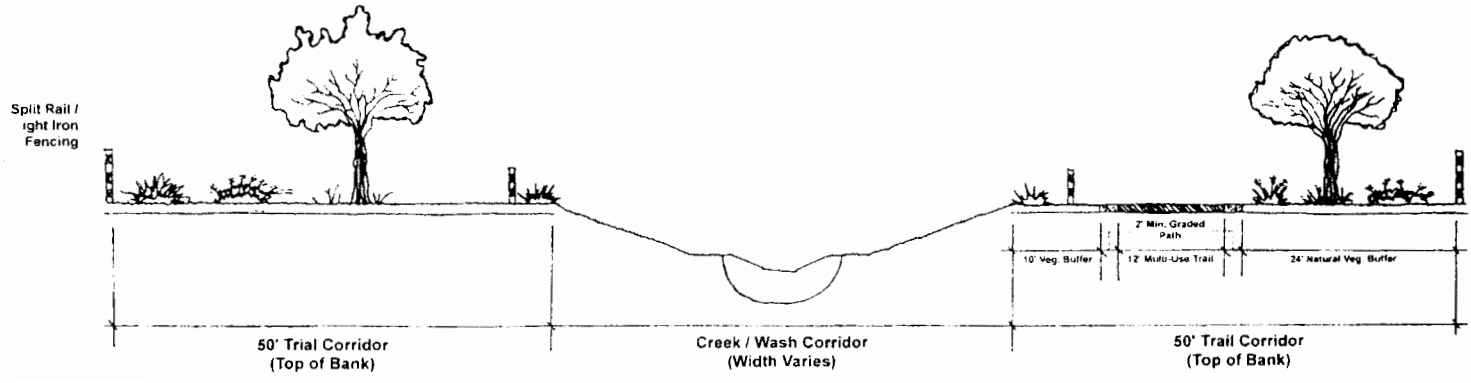


Future Trail / Wildlife Corridor

Multi-Use / Equestrian Trial Cross Sections



Barney's Creek Multi-Use Trail Cross Section



6 or 7 feet

4 or 5 feet

West Jordan

Barney's Creek
Multi-Use Trail System

User Information

Respect the Privacy of land & ownership along the trail system.
Please leave no trace of your passage, place all trash in trash receptacles.
Respect trail closures implemented to protect visitors & natural resources.

Be aware that you are sharing the trail with cyclists & equestrians.
Please yield to equestrians, & allow ample space for their passage.

Please use a helmet & gloves.
Ride at a safe & controlled speed.
Yield to hikers & equestrians.
Alert other trail users with a bell, or other audible signal when approaching from behind.

6 or 7 feet

4 or 5 feet

West Jordan City
Barney's Creek

Multi-Use Trail System

Trail User Information and Regulations

All Visitors: Respect the privacy of land and homeowners along the trail system.
Please leave no trace of your passage, place all trash in trash receptacles.
Respect trail closures implemented to protect visitors and natural resources.
Please use a helmet and gloves when riding cyclists or other forms of human-powered transportation.
Share the trail.

Brick base

Base depth of 24 inches

Base height of 18 inches

8 or 9 feet

6 or 7 feet

4 or 5 feet

Barney's Creek
Multi-Use Trail System

All Visitors	Hikers & Pedestrians	Cyclist
Respect the Privacy of land & homeowners along the trail system. Please leave no trace of your passage, place all trash in trash receptacles. Respect trail closures implemented to protect visitors & natural resources.	Be aware that you are sharing the trail with cyclists & equestrians. Please yield to equestrians, & allow ample space for their passage.	Please use a helmet & gloves. Ride at a safe & controlled speed. Yield to hikers & equestrians. Alert other trail users with a bell, or other audible signal when approching from behind.

West Jordan

1 or 1 1/2 feet

4 or 5 feet

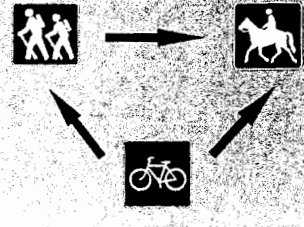
Barney's Creek Trail

Remember To Share The Trail

2 or 3 feet

3 or 4 feet

Barney's Creek Trail



Wendell Rigby

From: Tim Peters
Sent: Tuesday, September 05, 2006 3:14 PM
To: Brian Clegg
Cc: Richard Lewis; Bill Baranowski; Joe Morgan; Tom Burdett; Wendell Rigby; Nate Nelson
Subject: RE: Trail Head Signage

Those are nice looking signs.
For a trailhead sign, I would consider using something similar to the signs in place on the Jordan River Trail as opposed to having different signs at the different trails and parks throughout the City. We need to adopt a standard and then "stick with it." I recommend keeping the signs as similar as possible throughout the City. In addition, I would **strongly** recommend using anti graffiti sealant regardless of what sign you select...

-----Original Message-----
From: Peter Simmons
Sent: Tuesday, September 05, 2006 2:50 PM
To: Brian Clegg
Cc: Richard Lewis; Tim Peters; Bill Baranowski; Joe Morgan; Tom Burdett; Wendell Rigby; Nate Nelson
Subject: Trail Head Signage

Brian,

Here are some sample trail head signs. Please review and get me any comments. We have not looked into material or cost, which will be the next step once we choose a design. I will be forwarding this information over to Rick Lewis to see who else shold be contacted. I would appreciate your comments as soon as possible.

Thanks,
Pete

Wendell Rigby

From: Peter Simmons
Sent: Tuesday, September 05, 2006 2:50 PM
To: Brian Clegg
Cc: Richard Lewis; Tim Peters; Bill Baranowski; Joe Morgan; Tom Burdett; Wendell Rigby; Nate Nelson
Subject: Trail Head Signage

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Thanks,
Pete

P&T

Wendell Rigby

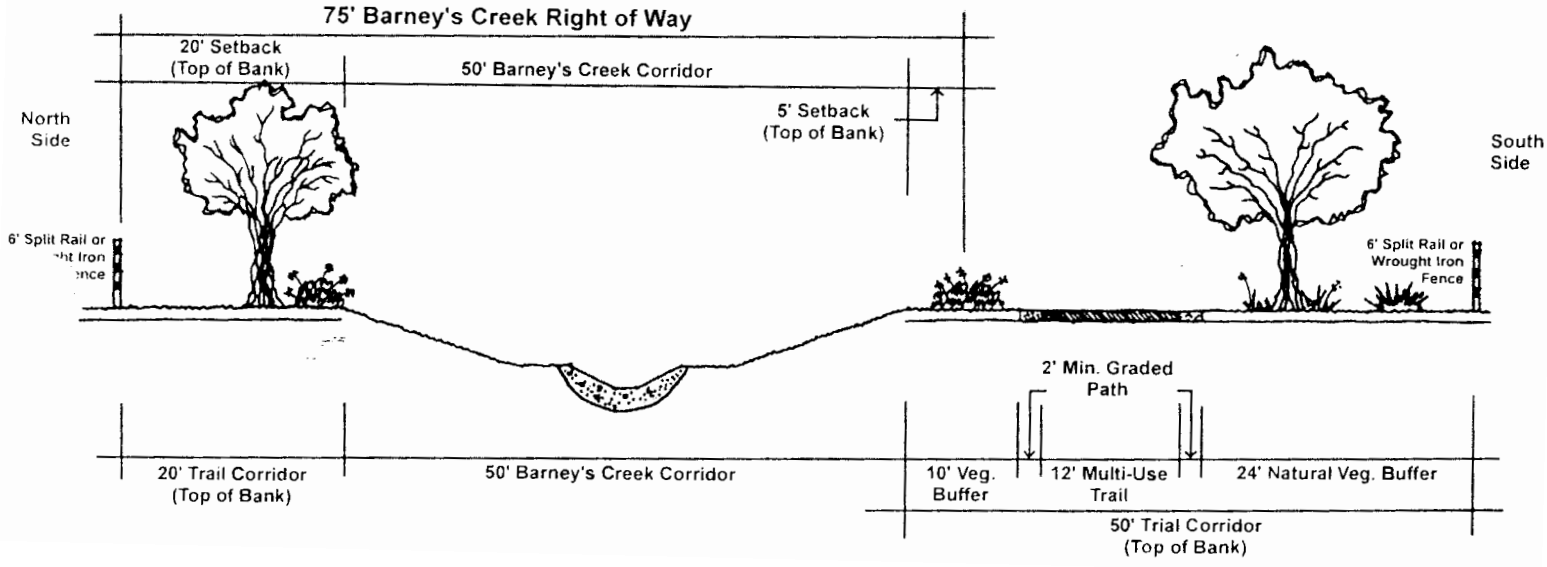
From: Peter Simmons
Sent: Friday, February 17, 2006 2:40 PM
To: Richard Lewis; Tom Burdett; Wendell Rigby
Cc: Brian Clegg; Greg Davenport; Nate Nelson; Paul Coates
Subject: Three Forks Corridor Determination

Rick & Tom,

Here is a copy of the memo to Peterson regarding the creek corridor determination. I will forward this onto Wendell & Brian. If you have any revisions please let me know and I will incorporate them.

Pete

Barney's Creek Alignment & Proposed Barney's Creek Multi-Use Trail Cross Section



City of West Jordan

Planning and Zoning Division
February 17, 2006

MEMORANDUM

TO:	Justin Peterson
FROM:	Peter Simmons, Associate Planner
SUBJECT:	Northside of Barney's Creek
PROJECT:	3 Forks Phase 3 - 5

Planning Staff has met with Engineering, Parks and the Fire Department to discuss the design of north side of Barney's Creek as it pertains to 3 forks Phases 3 – 5. We have discussed in the past keeping the creek corridor consistent throughout the 3 Forks development. Staff has mentioned the multi-use trail will be placed on the south side of Barney's Creek for consistency as the trail comes through Ivory's Development and 3 Forks.

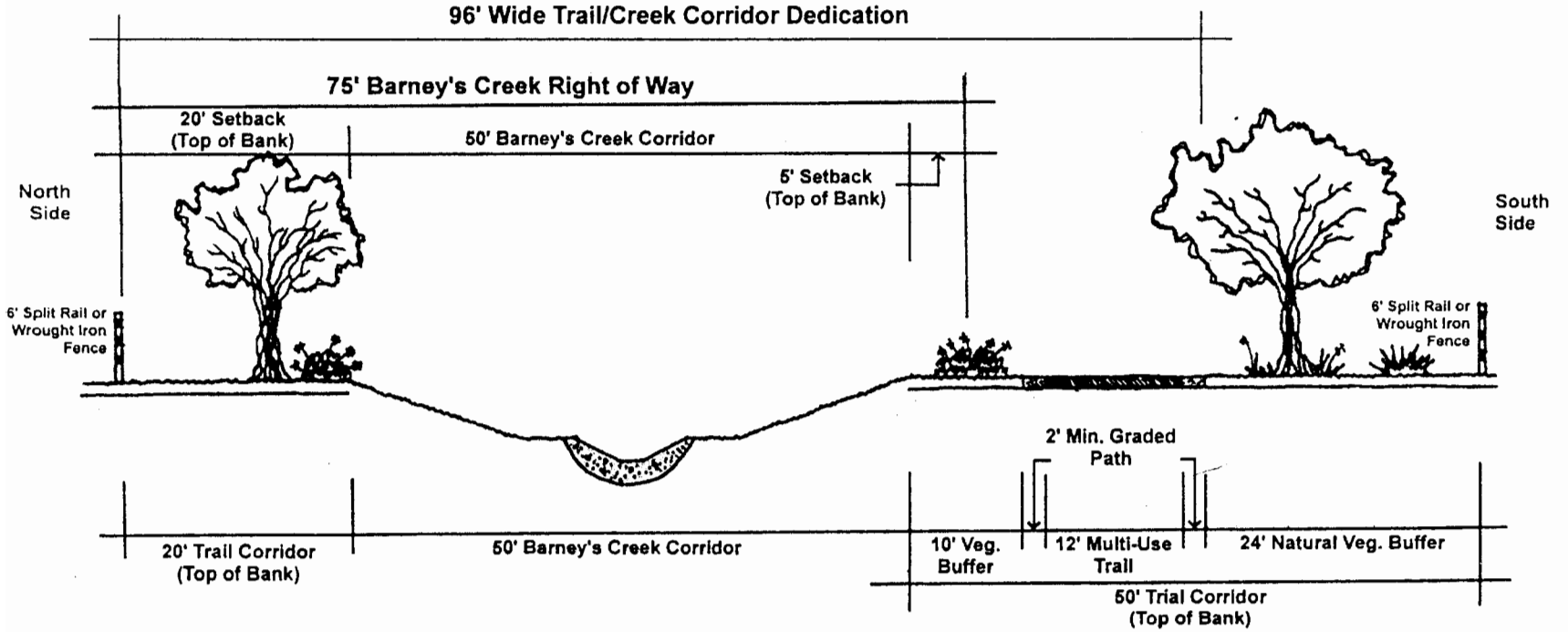
As staff prepares the trail specifications for the Multi-Use Trail, we are proposing a minimum 50' setback from the top of bank of Barney's Creek. However, the approved construction drawings for the Barney's Creek realignment show a 20' setback from top of bank along the north side. Staff is willing to keep the design layout as approved with the 20' setback and keeping that setback consistent through phases 3 - 5. Staff will be proposing that an additional 45' be dedicated along the south side of the Barney's Creek, which will be a total of 50' from top of bank. The 50' will allow for the installation of the needed maintenance road/ multi-use trail. Staff has attached a copy of the typical cross section for this area.

Staff is available to meet to discuss the enclosed comments, once your design team has reviewed them, so please contact me at 569-5098.

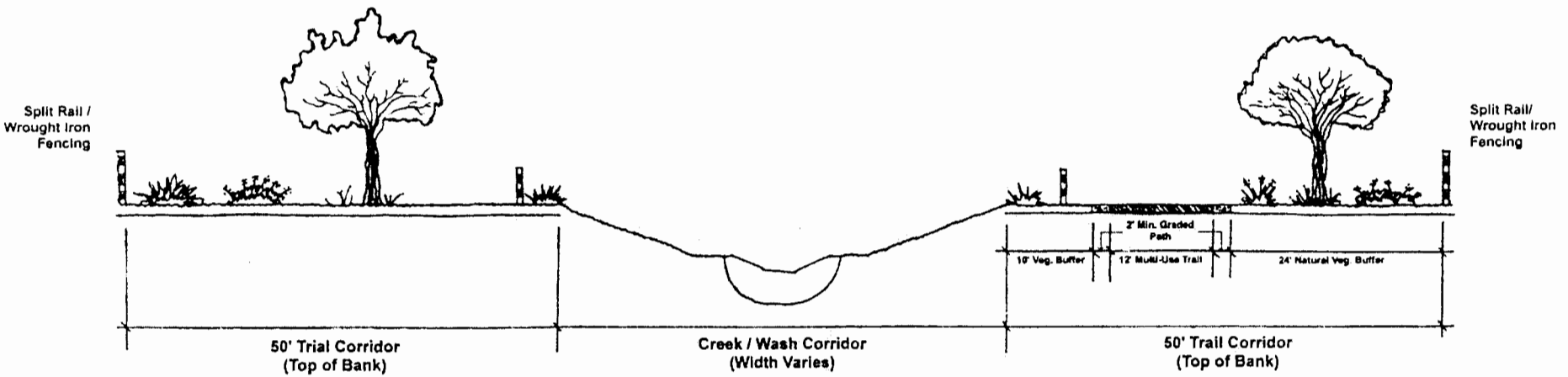
Sincerely,

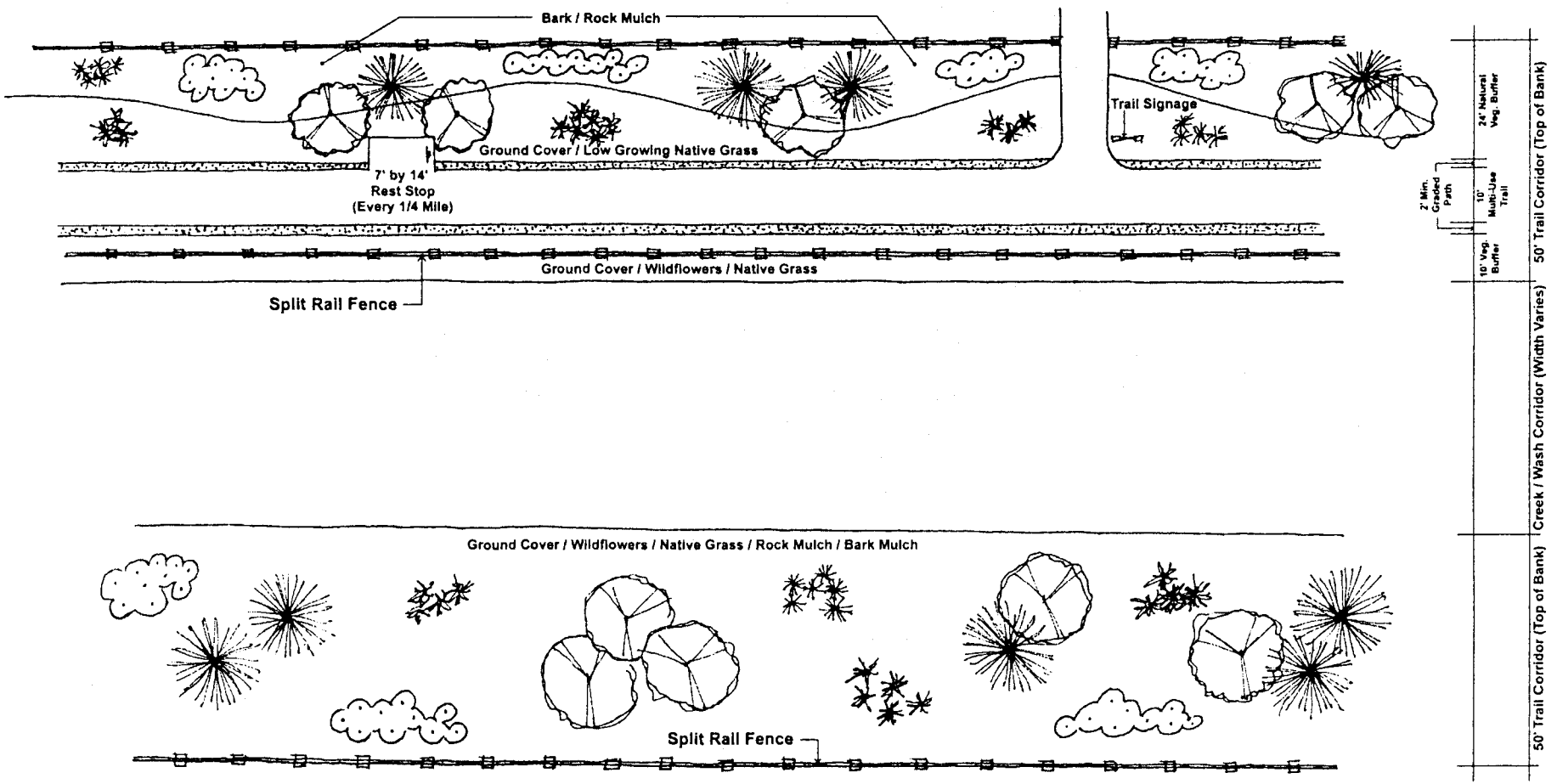
Peter Simmons
Associate Planner

Multi-Use Trail Cross Section through 3 Forks Subdivision



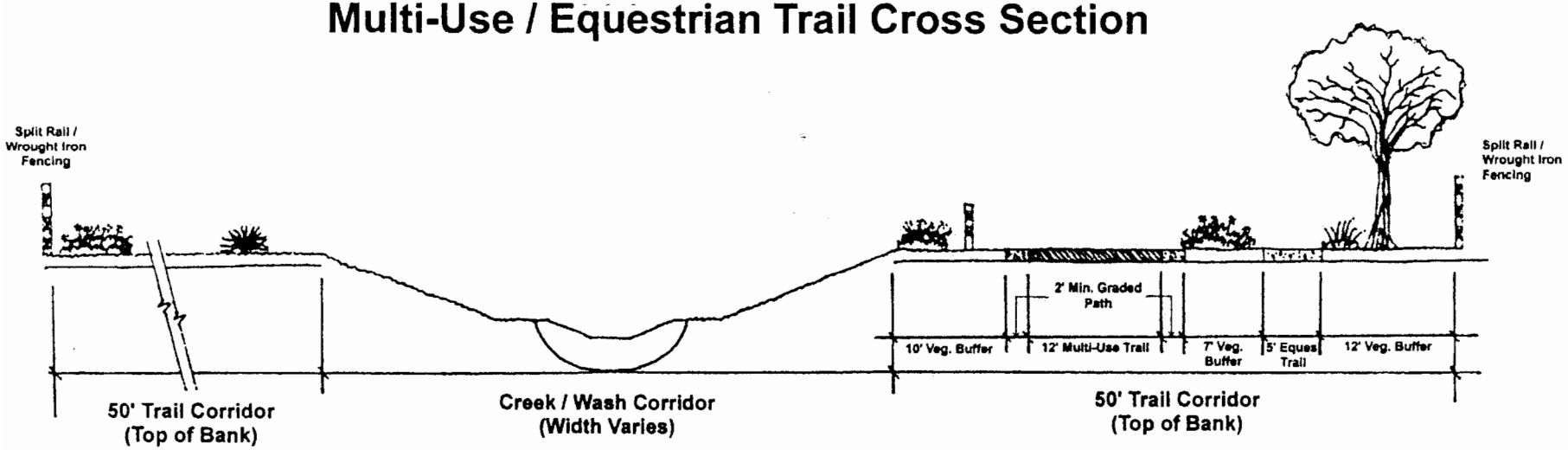
Barney's Creek Multi-Use Trail Cross Section





Barney's Creek Multi-Use Trail Plan View

Multi-Use / Equestrian Trail Cross Section



CITY OF WEST JORDAN

BARNEY'S CREEK GREENWAY - TRAIL SYSTEM STUDY

March 23, 1998

Prepared for:

City of West Jordan
9000 South Redwood Road
West Jordan, Utah 84088

Prepared By:

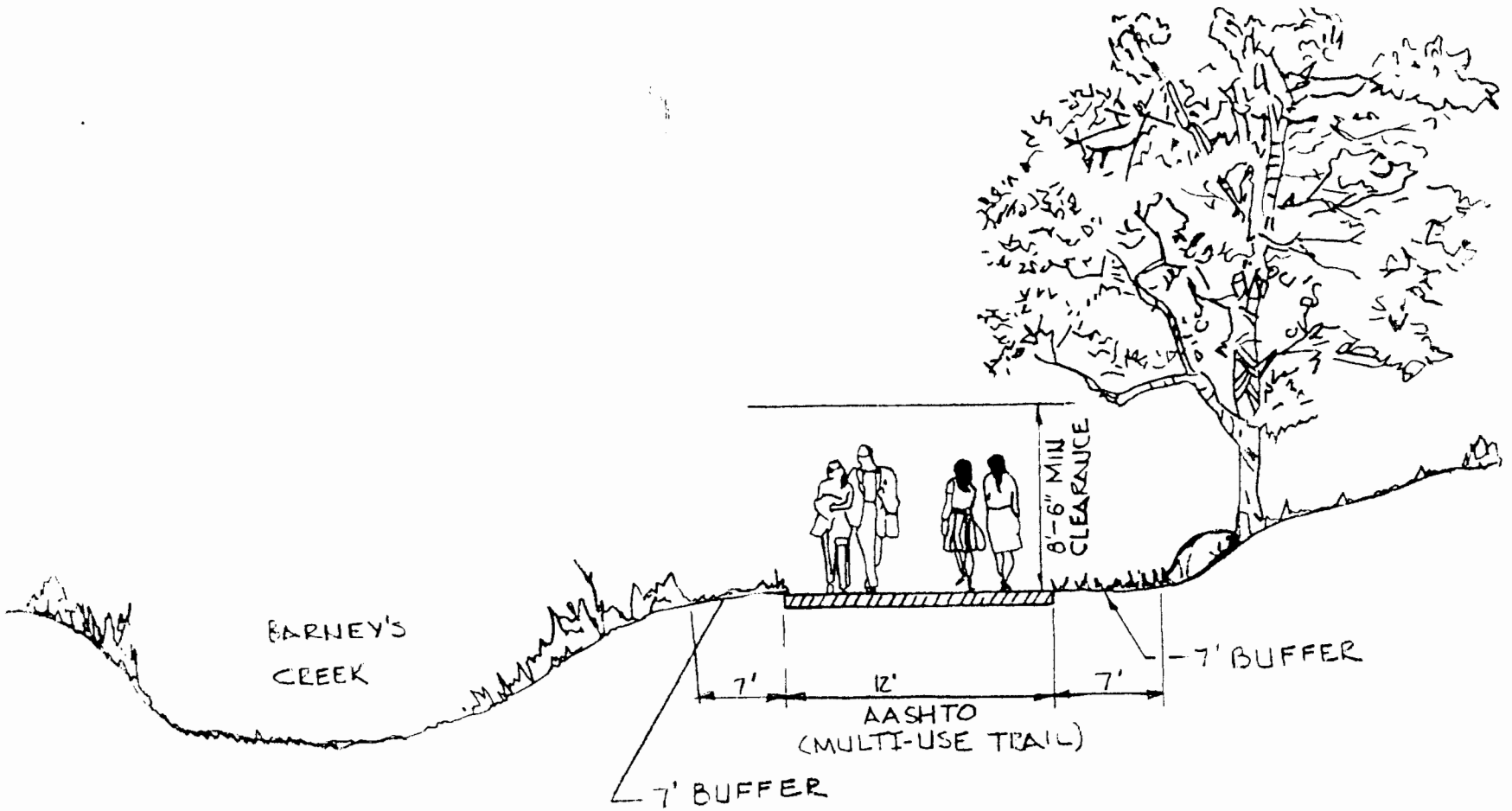
Thompson-Hysell, Inc.
2496 West 4700 South
Taylorsville, Utah 84118

Tully Design Group, Inc.
977 East Yale Avenue
Salt Lake City, Utah 84015

V. GREENWAY-TRAIL SYSTEM PLANNING GUIDE DETAILS

As part of this study, a series of preliminary greenway standards have been developed, referred to as *Planning Guide Details*. The intention of these planning guide details is to assist the City of West Jordan in the establishment of greenway parameters for the Study Area and for future expansion of the greenway system as it expands to the west. The planning guide details are listed below and presented at the end of this section.

Planning Guide Detail No 1:	Detail of trail pathway.
Planning Guide Detail No 2:	Detail establishing the parameters for the correlation of the greenway with a roadway along one side and residential backyards on the other.
Planning Guide Detail No. 3:	Detail establishing the parameters for the correlation of the greenway with backyards along both sides.
Planning Guide Detail No 4:	Detail establishing design criteria for trail user underpasses beneath roadway bridges.



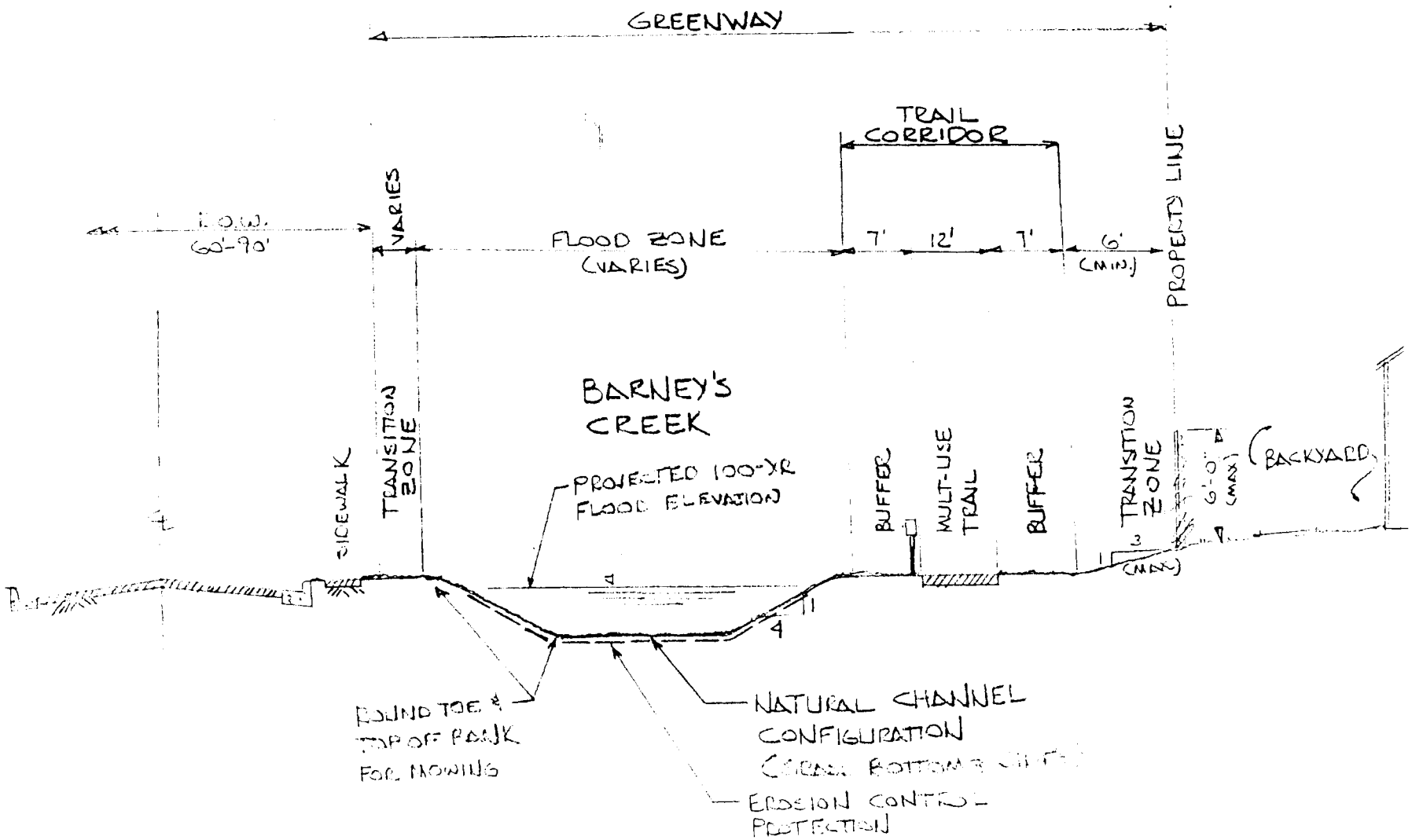
THOMPSON-HYSELL, INC.
2496 West 4700 South, Taylorsville, UT 84118

Tully Design Group, Inc.
Landscape Architecture
Land Planning
977 East Yale Avenue
Salt Lake City, Utah 84105
(801) 355 - 9940

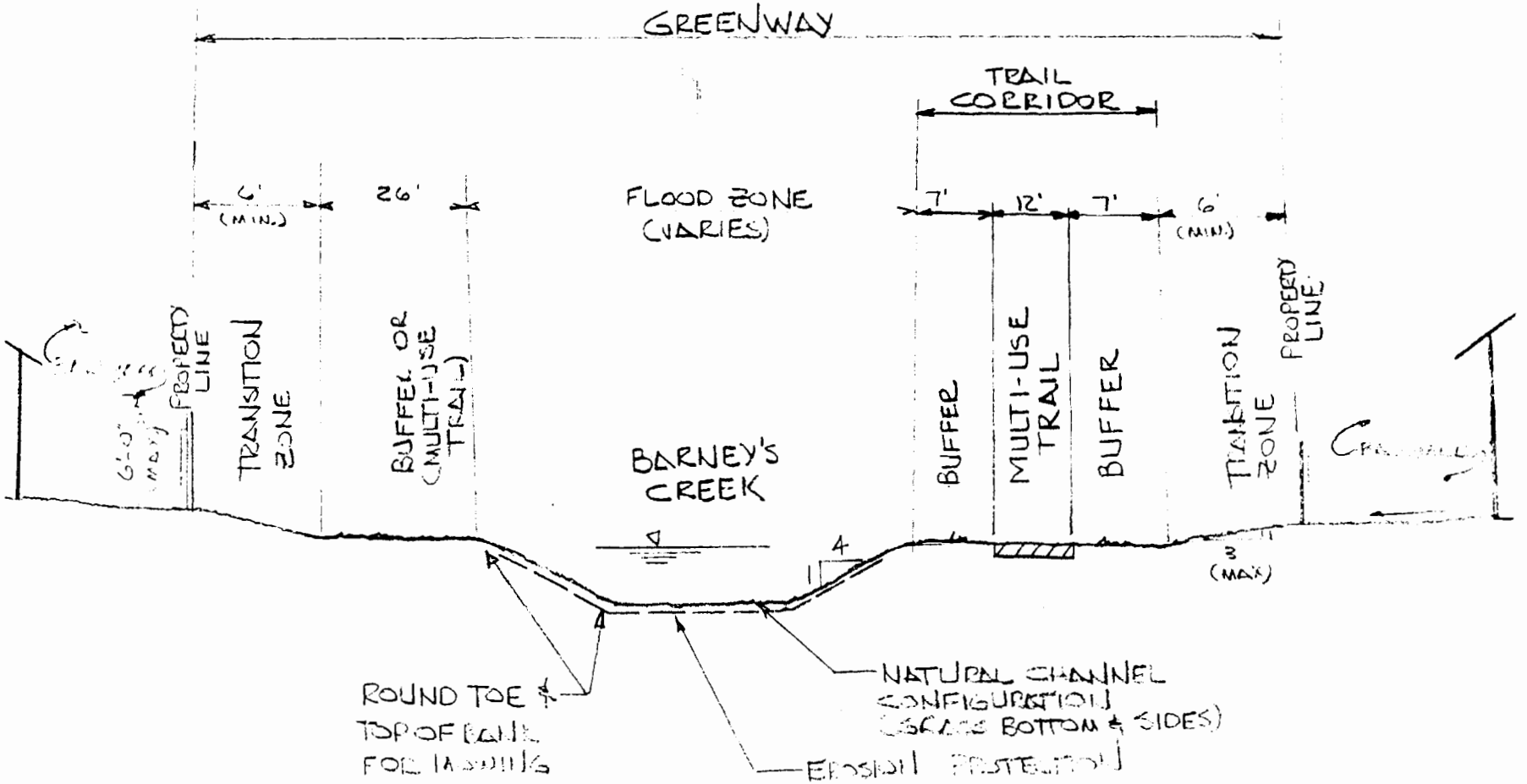
City of
West Jordan
Engineering Division
8000 South Redwood Road
West Jordan, Utah 84088

Barney's Creek Greenway - Trail System Study

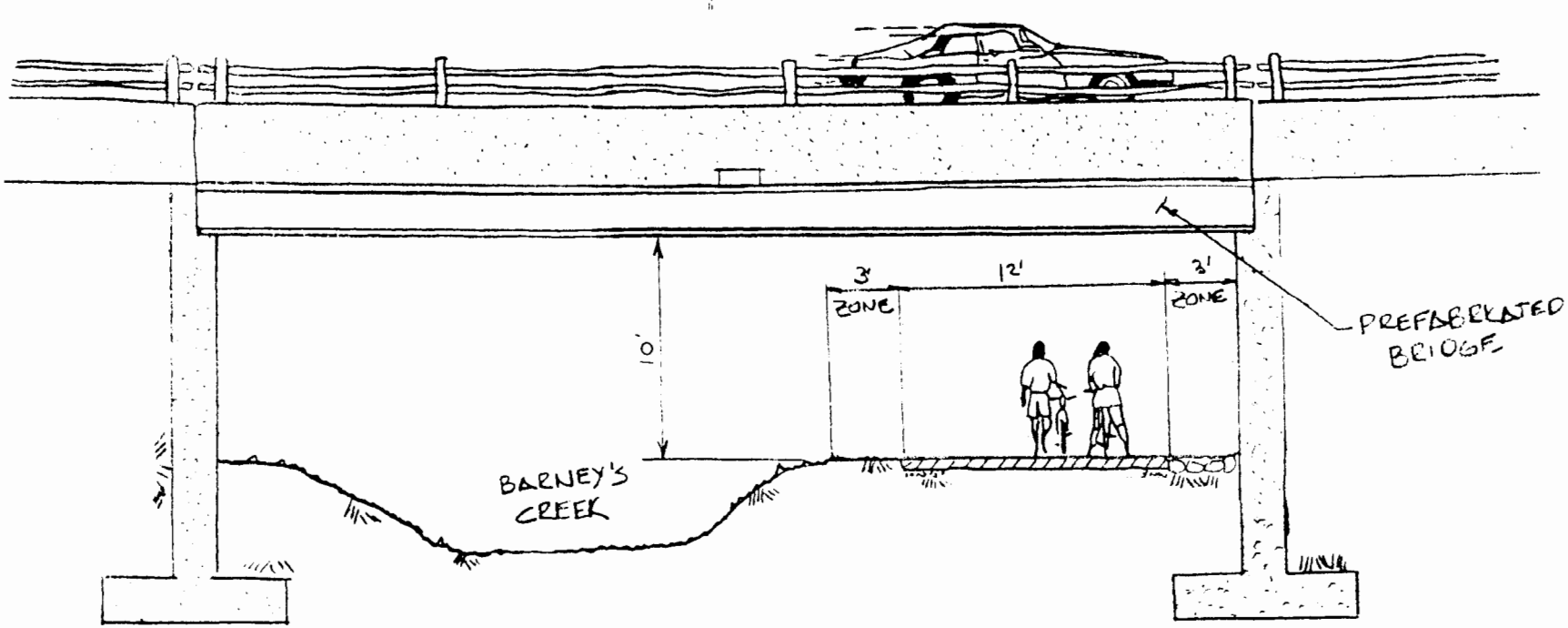
Planning Guide Detail No. 1



THOMPSON-HYSELL, INC. 2496 West 4700 South, Taylorsville, UT 84118	Tully Design Group, Inc. Landscape Architecture Land Planning 977 East Yale Avenue Salt Lake City, Utah 84106 (801) 355 - 9940	City of West Jordan Engineering Division 8000 South Redwood Road West Jordan, Utah 84088	Barney's Creek Greenway - Trail System Study	Planning Guide Detail No. 2



THOMPSON-HYSELL, INC. 2496 West 4700 South, Taylorsville, UT 84118	Tully Design Group, Inc. Landscape Architecture Land Planning 977 East Yale Avenue Salt Lake City, Utah 84106 (801) 355 - 9946	City of West Jordan Engineering Division 8000 South Redwood Road West Jordan, Utah 84088	Barney's Creek Greenway - Trail System Study	Planning Guide Detail No. 3



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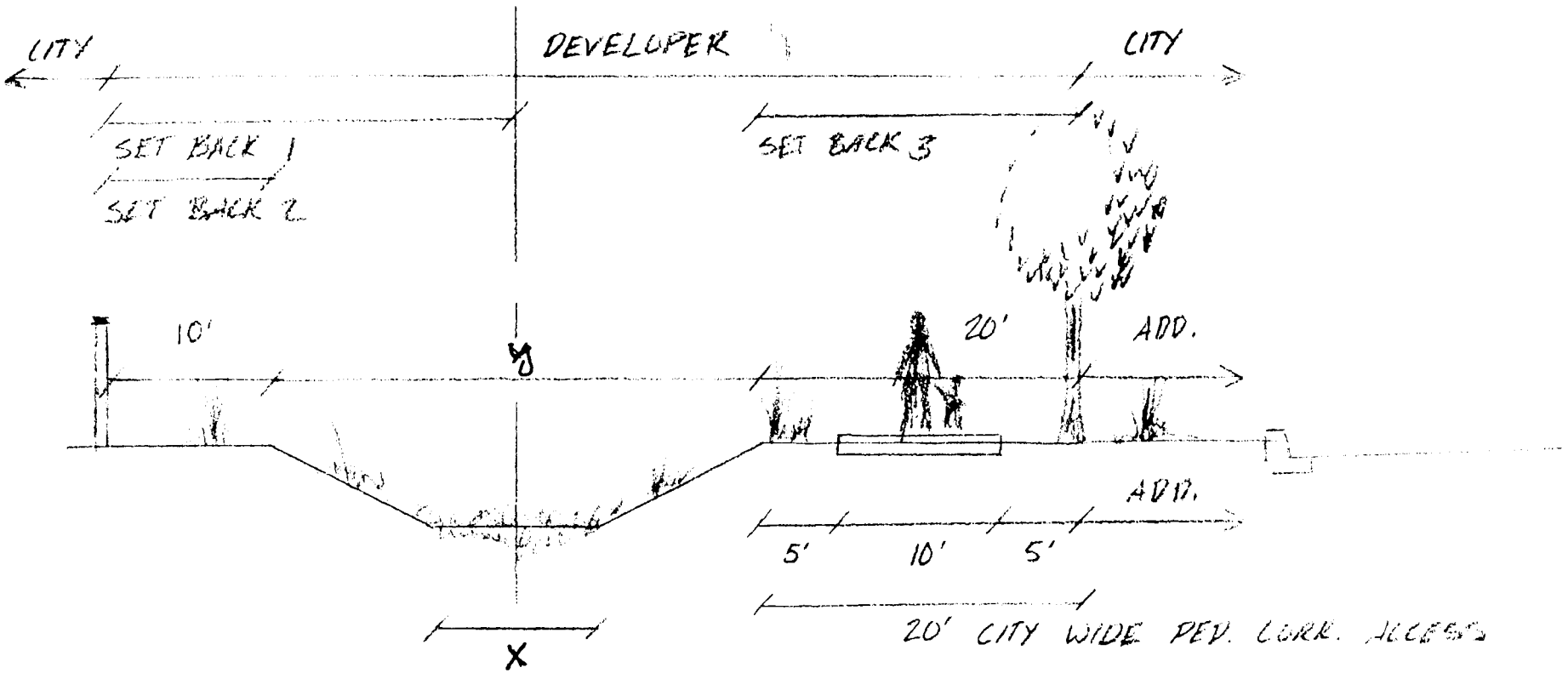
City of
West Jordan
Engineering Division
8000 South Redwood Road
West Jordan, Utah 84088

Barney's Creek
Greenway - Trail System
Study

Planning Guide
Detail No.
4

W. ST JORDAN TRAILS CROSS SECTION



X = LOW FLOW

Y = HIGH FLOW

Park Trails (Types I, II, and III)

Park trails are multipurpose trails located within greenways, parks, and natural resource areas.

General Description: Park trails are multipurpose trails located within greenways, parks, and natural resource areas. They are the most desirable type of trail because they:

- Emphasize harmony with the natural environment.
- Allow for relatively uninterrupted pedestrian movement to and through the city's park system and development areas, including, where possible, through commercial and industrial parks.
- Effectively tie the various parks and recreation areas together to form a comprehensive park and trail system.
- Protect users from urban development and associated vehicular traffic.

The three types of park trails illustrated are intended to accommodate walkers, bicyclists, and in-line skaters.

Given their attributes, park trails are at the top of the trail classification hierarchy. They should be considered the preferred trail type and used to the greatest extent possible.

Development Parameters: Important steps in developing park trails are:

- Preparing a comprehensive park and trail system plan that clearly defines the routing of park trails, especially those within greenways.
- Acquiring the desired land or establishing trail easements at an early stage of community development.
- Establishing appropriate development policies (backed by city ordinance) requiring land developers to incorporate greenways and park trail corridors into their development plans in accordance with the trail system plan.
- Establishing design standards that define how park trails are to be built. Trail design should coincide with standards adopted by local and state departments of transportation and AASHTO (American Association of State Highway Transportation Organizations), as appropriate. All trails should comply with ADA (Americans with Disabilities Act) design criteria.

In previously developed cities, abandoned railroad beds, run-down waterfronts, utility rights-of-way, and scenic/historic routes provide the greatest opportunity for park trails.

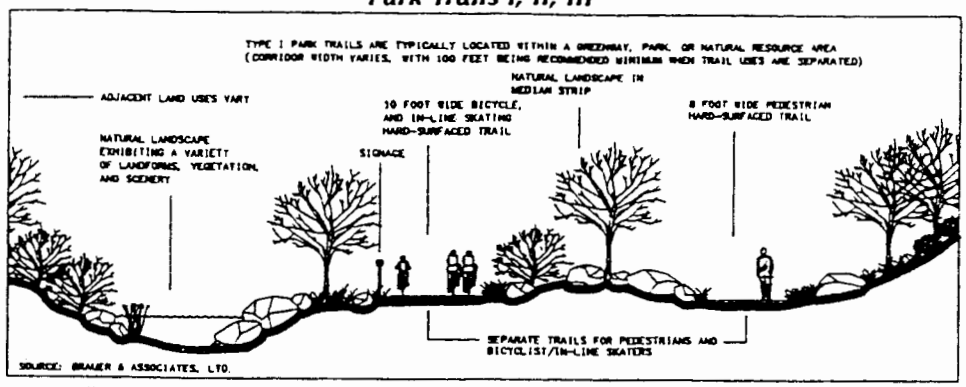
Types of Trails: There are three types of trail under the park trail classification:

- Type I trails are used in situations where use patterns dictate separate paths for pedestrians and bicyclists/in-line skates. An example would be a trail around an inter-city lake or along a riverfront.
- Type II trails are more suited to lighter use patterns, such as from a housing subdivision to a natural resource area.
- Type III trails are suited for areas requiring minimum impact, such as nature preserves.

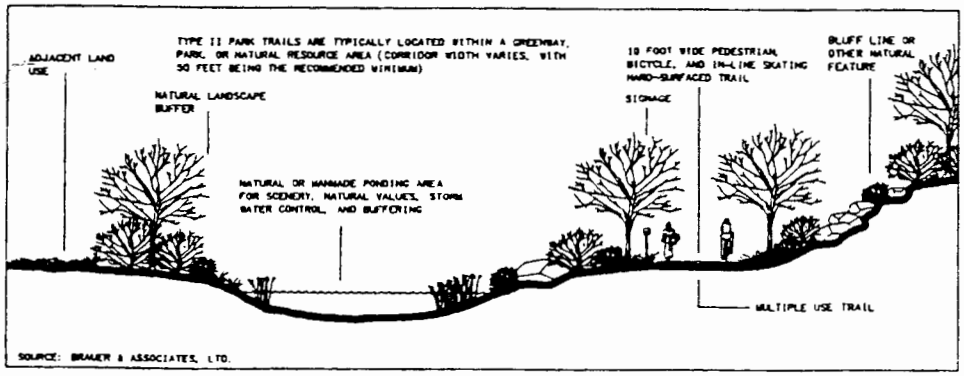
The type used depends on application. ***Figure 4.8 - Park Trail Types*** illustrates a typical cross-section of each type.

Commuter Linkages: Park trails can certainly be used for bicycle commuting purposes. The type of trail used and its design should reflect the anticipated magnitude of commuter use. On the high end, Type I trails as shown may not be adequate to safely accommodate a "bicycle freeway" type of use. In such a case, wider or directional trails may be appropriate.

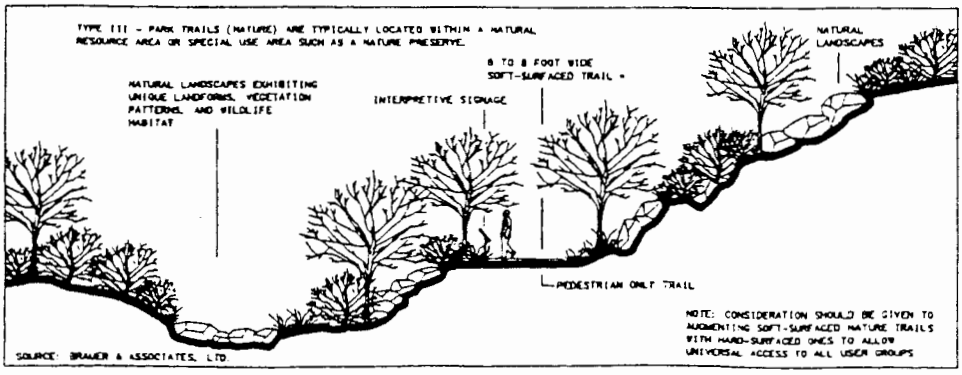
Figure 4.8
Park Trails I, II, III



TYPE I PARK TRAIL



TYPE II PARK TRAIL



TYPE III PARK TRAIL (NATURE TRAIL)

Connector Trails (Types I, and II)

Connector trails are multipurpose trails that emphasize safe travel for pedestrains to and from parks and around the community.

General Description: The significant difference between connector and park trails lies largely in their location. Park trails emphasize a strong relationship with the natural environment within a park-like setting, while connector trails or recreation connectors emphasize safe travel for pedestrians and bicyclists to and from parks and around the community. In general, connector trails are located within existing road rights-of-way and utility easements or along artificial drainageways. The two classes of connector trails illustrated are intended to accommodate walkers, horseback riders, bicyclists, and in-line skaters.

Development Parameters: Important steps in developing connector trails are:

- Preparing a comprehensive park and trail system plan that clearly defines the routing of connector trails.
- Establishing trail rights-of-way and easements at an early stage of community development.
- Establishing design standards that define how connector trails are to be built. Trail design should coincide with standards adopted by local and state departments of transportation and AASHTO, as appropriate.

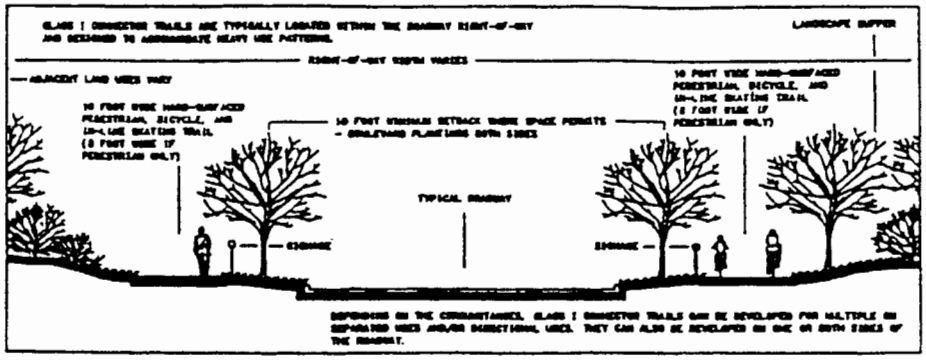
Types of Trails: There are two types of trail under the connector trail classification:

- Type I trails are used in situations where use patterns dictate separate paths for pedestrians, bicyclists and, if necessary, in-line skaters. An example would be a trail within the shoulder of right of way of a collector street or parkway.
- Type II trails are suited to lighter use patterns, such as a link between a parkway or thoroughfare and a nearby housing development.

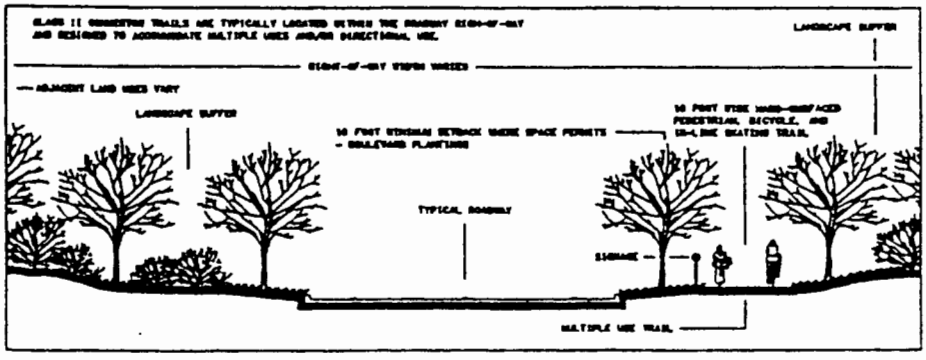
The type used depends on application. ***Figure 4.9 - Connector Trail Types*** illustrates a typical cross-section of each type.

Commuter Linkages: Connector trails can be used for bicycle commuting purposes. The type of trail used and its design should reflect the anticipated magnitude of commuter use. As was with Type I Park Trails, Type I Connector Trails may not be adequate to safely accommodate a "bicycle freeway" type of use. In such a case, wider or directional trails may be appropriate.

Figure 4.9
Connector Trail Types
Type I, II



TYPE I CONNECTOR TRAIL



TYPE II CONNECTOR TRAIL

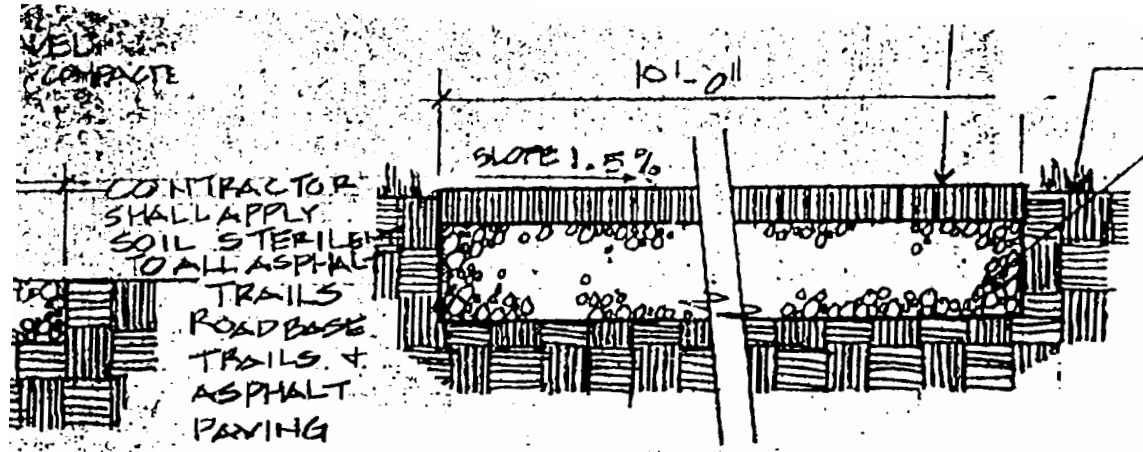
Bikeways (Bike Routes and Lanes)

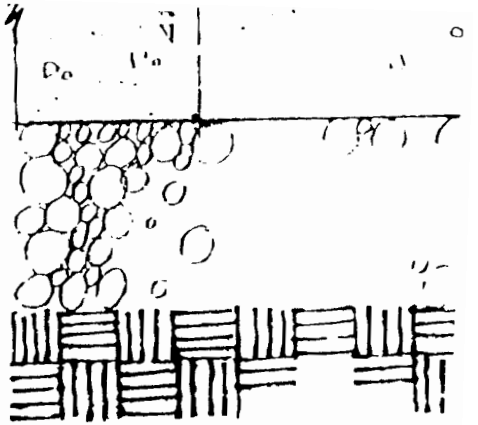
Bikeways are paved segments of roadways that serve to safely separate bicyclists from traffic.

General Description: Bikeways are paved segments of roadways that serve to safely separate bicyclists from traffic. They come in the form of bike routes and bike lanes. The distinction between the two is a matter of exclusivity. While bike routes are essentially paved shoulders or segments of the roadway that serve to separate bicyclists from traffic, bike lanes are designated portions of the roadway for the preferential or exclusive use of bicyclists.

It is important to recognize that bikeways serve distinct user groups, including:

- Commuters—those who use their bicycle as a means to get from point A to B as expeditiously as possible. Their trips can be viewed as substitutes for vehicle trips when planning light transportation ways.
- Fitness enthusiasts—those who cycle for fitness as well as recreation.
- Competitive athletes—those who bicycle competitively.





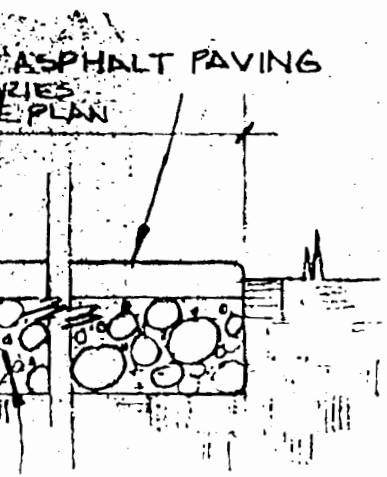
etail

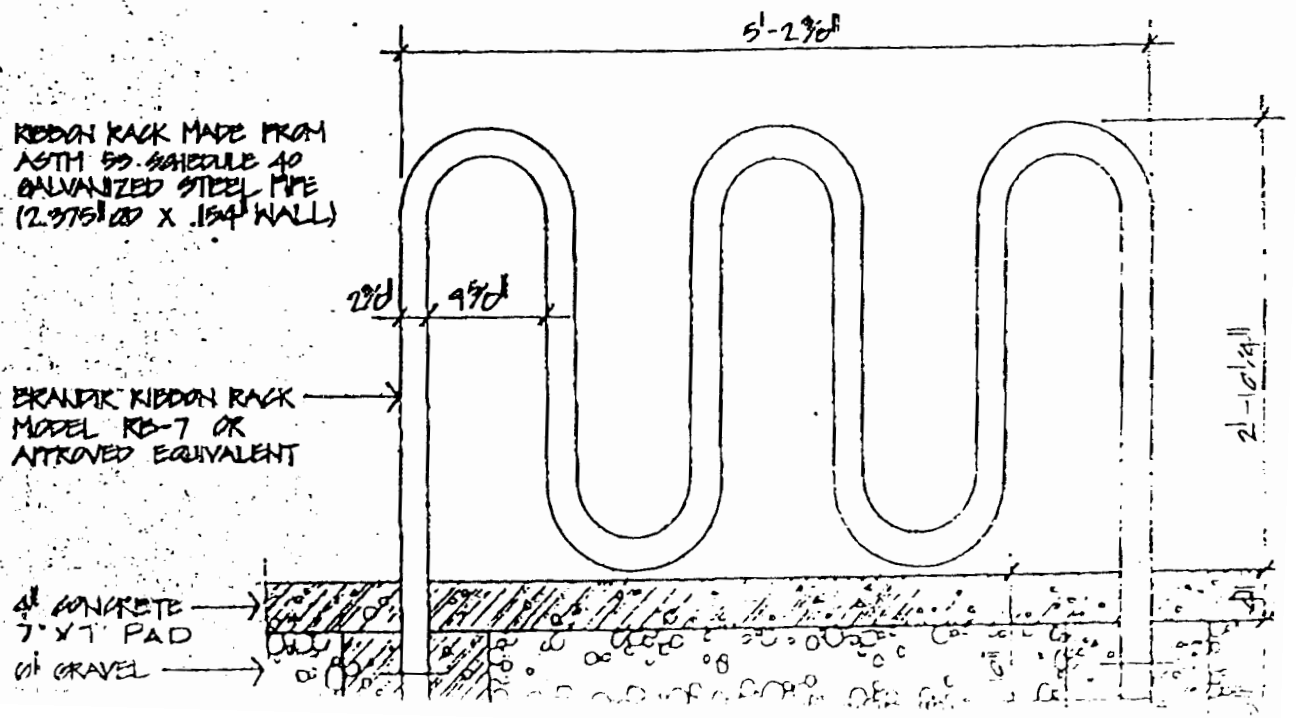
B Asphalt Walk Detail

1"=1'-0"

C CONCRET

QUESTRIAN PATH
OUT W/ PEDESTRIAN
OCATION (SEPARATE W/
PLIT RAIL FENCE





"Nature is the basis, but man is the goal...."

--George Santayana

Trail Development Standards

Chapter 4

SALT LAKE COUNTY REGIONAL TRAILS PLAN

Prepared for Salt Lake County Parks & Recreation Division

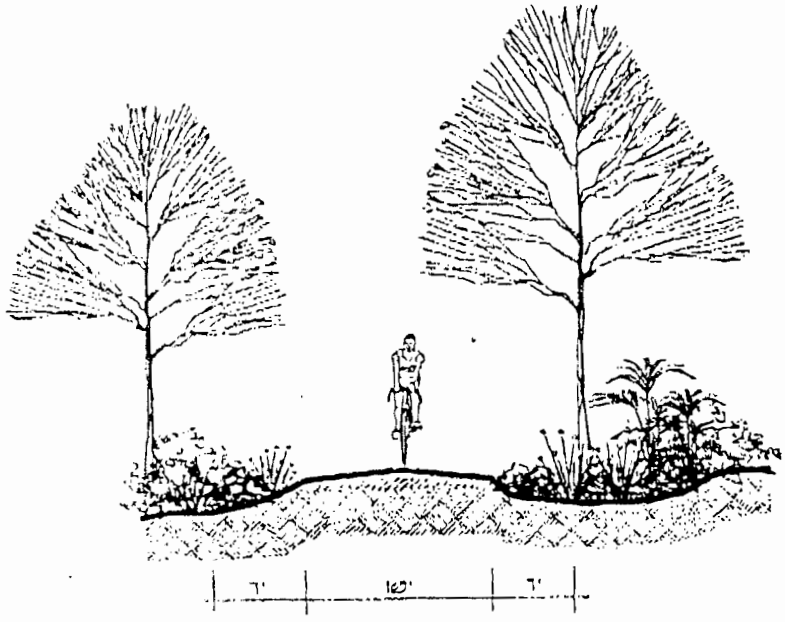
Prepared by A/E Intra Group

PURPOSE OF TRAIL DEVELOPMENT STANDARDS

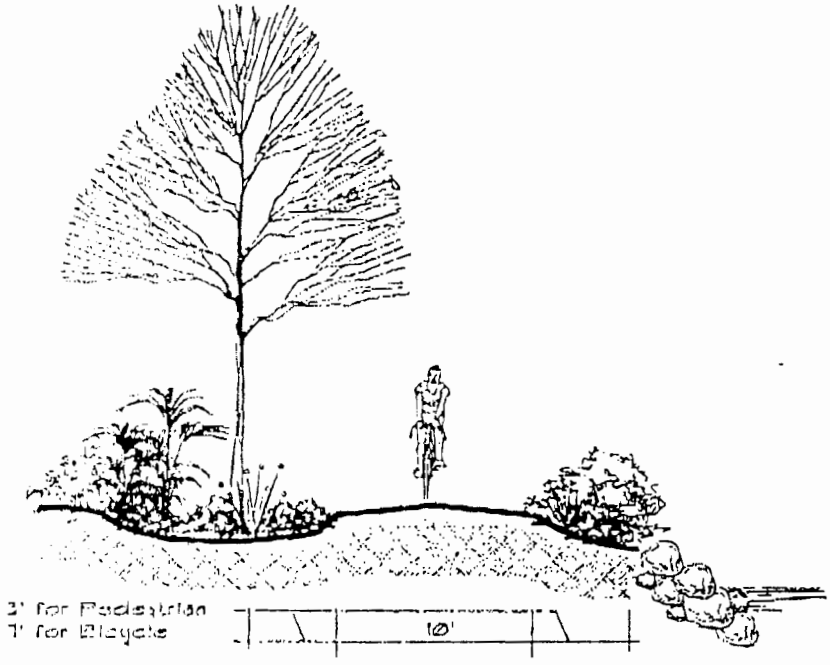
Construction standards for the development of trails will help encourage uniformity throughout the entire regional trails system. While standards serve as a convenient guide to encourage the uniformity of trail construction, deviation from standards will be necessary when conditions or preferences dictate.

TRAIL CLASSIFIED BY USE AND FUNCTION

Trail classes designate the type of construction and the admissible use(s) on an individual trail. The question, "Who has the trail been built for" mandates trail classification. This Regional Trails Plan identifies four types or classes of trail: 1) Paved Surface, for pedestrians and bicycles; 2) Gravel Surface, for pedestrians and bicycles; 3) Primitive, for pedestrians only; 4) Equestrian, for horses only.

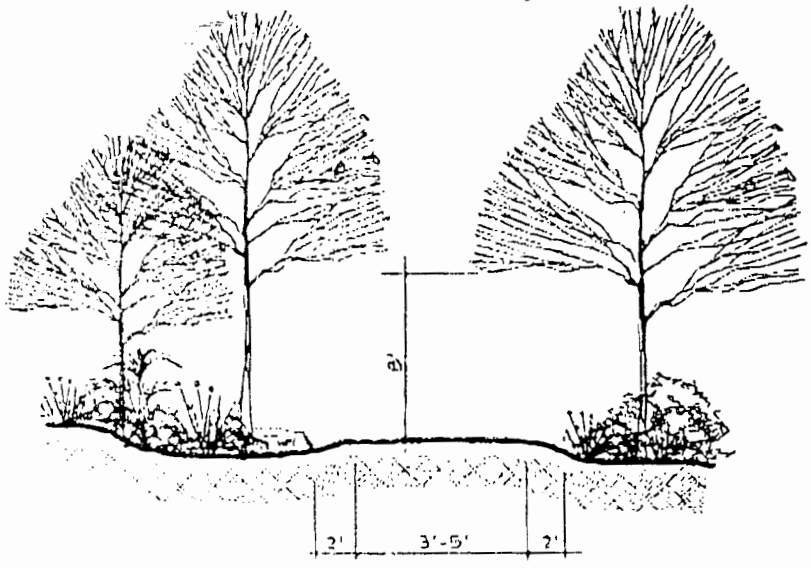


■ PAVED SURFACE TRAIL
■ 10' Wide surface ■ Sub-grade preparation ■ Concrete (preferred), Asphalt (Alt) ■ Vertical gradient range - up to 3% slope is desirable, 10% slope is maximum, 15% slope is allowable for short distances only ■ Clearances - 7' horizontal, 8' vertical ■ Horizontal alignment - as per plan ■ Pedestrian/Bicycle uses only



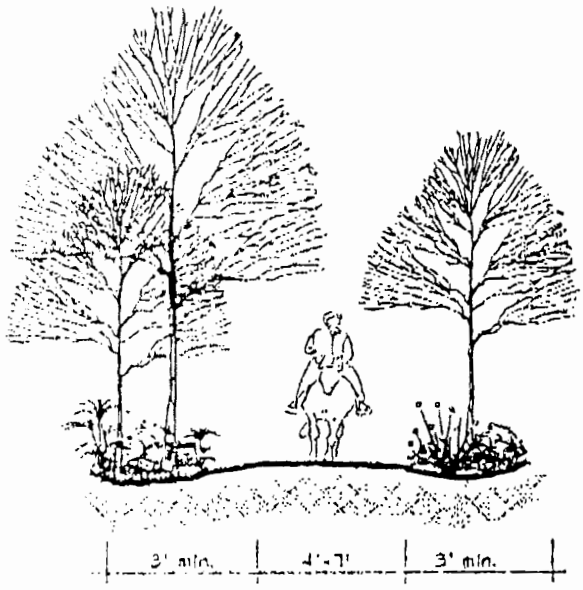
■ GRAVEL SURFACE TRAIL

■ 10' Wide surface ■ Sub-grade preparation ■ 1/2" crushed gravel surface ■ Clearances for pedestrian use - 3' horizontal, 8' vertical ■ Clearances for bicycle use - 7' horizontal, 8' vertical ■ Horizontal alignment - as per plan ■ Vertical gradient range - up to 10% slope is desirable, 12% slope is maximum, 15% slope is allowable for short distances only. ■ Pedestrian/Bicycle use only .



■ PRIMITIVE TRAIL

■ 3-5' Wide surface ■ Un-surfaced ■ Clearances - 2' horizontal, 8' vertical ■ Vertical gradient range - up to 10% slope is desirable, 20% slope is maximum, 25% slope is allowable for short distances only. ■ Pedestrian uses only.



■ EQUESTRIAN TRAIL

4-7' Wide soft surface: sand, un-crushed gravel, wood chips ■ Vertical gradient range - up to 10% desirable, 15% is maximum. ■ Clearances - 2' horizontal, 8' vertical ■ Horse use only

Chapter 7
BICYCLES

States and communities of all sizes throughout the country are undertaking significant investments in facilities to encourage bicycle and pedestrian transportation. Why should cities encourage bicycle transportation? Non-motorized travel has benefits in a number of areas, as outlined below:

1. Personal reasons

- Offers least expensive mode of travel (except for walking).
- Reduces travel time compared to walking or where parking is scarce.
- Provides door-to-door access.
- Provides cardiovascular fitness.

2. Environmental reasons

- Reduces air pollution/global warming/acid rain.
- Decreases reliance on petroleum products.
- Decreases noise pollution from automobiles.
- Decreases land area devoted to parking.
- Most energy-efficient mode of transportation.

3. Societal reasons

- Reduces vehicle trips.
- Improves public health through a cleaner environment, more exercise.
- Provides mobility for citizens without cars or those too young to drive.
- Improves overall quality of life.
- Increases 5-minute catchment area of public transit from ¼-mile by walking to 1-mile by biking.

Additionally, federal policy through the Transportation Equity Act for the 21st Century (TEA-21) legislation strongly supports such activities, and significant sources of funding for these types of projects have been made available through the Transportation Enhancement Program and, in non-attainment areas, through the Congestion Mitigation and Air Quality (CMAQ) improvement program of TEA-21.

7.1 FACILITY DESCRIPTIONS

7.1.1 Types of Bicyclists

The primary objective of the citywide trails and bikeway network is to serve the needs of all types of bicyclists. There are many types of bicyclists with varying levels of skill and willingness

7.1.2 Bikeway Types

The following descriptions of bicycle-related terms are provided to assist readers who are unfamiliar with bicycle terminology. The terms bicycle and bike are interchangeable.

- **Bikeway** - A thoroughfare suitable for bicycles - it may either exist within the right-of-way of other modes of transportation, such as highways, or along a separate and independent corridor..

- **Bicycle Facilities** - A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking facilities, maps, all bikeways and shared roadways.

- **Bicycle or Multi-use Path (Bike Path or Class 1)** - A bikeway physically separated from motorized vehicular traffic and either within the highway right-of-way or within an independent right-of-way. Bike path facilities are often excellent recreational routes and can be developed where right-of-way is available. Typically, bike paths are a minimum of 10 feet to 12 feet wide, with an additional graded area maintained on each side of the path.

- **Bicycle Lane (Bike Lane or Class 2)** - A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are ideal for minor thoroughfares or collectors. Under certain conditions, bike lanes may be beneficial on streets with significant traffic volumes and/or speeds. Under ideal conditions, minimum bike lane width is four feet.

- **Signed Bike Route (Class 3)** - A segment of a system of bikeways designated by appropriate directional and/or informational signs. In this plan, a Class 3 signed bike route may be a local or residential street, bicycle boulevard, an arterial with wide outside lanes, or a roadway with a paved shoulder.

- **Paved Shoulder** - The part of the highway that is adjacent to the regularly traveled portion of the highway, is on the same level as the highway, and when paved can serve as a bikeway. Paved shoulders should be at least four feet wide, and additional width is desirable in areas where speeds are high and/or a large percentage of trucks use the roadway.

- **Wide Outside Lane** - An outside (curb) lane on a roadway that does not have a striped bike lane, but is of sufficient width for a bicyclist and motorist to share the lane with a degree of separation. A width of 14 feet is recommended to safely accommodate both motor vehicles and bicycles.

- **Bicycle Boulevard** - A residential street that has been modified for bicyclist safety and access.

7.1.3 Bicycles on Sidewalks

Bicycles traveling on sidewalks is not a recommended practice and may cause significant safety hazards for both bicyclists and pedestrians. Although bicyclists and pedestrians can safely share separated trails and pathways, the shared use of a sidewalk is subject to behavior patterns not found on shared trails and pathways. First, a minimum 10-foot width is recommended for shared trails and pathways; sidewalks are not usually that wide and may also have obstructions such as posts, benches, trash containers, and newspaper racks which further reduce the travel width. Second, bicyclists are generally not expected to be on the sidewalk; consequently, pedestrians are less likely to watch for bicyclists and may be more prone to colliding with a bicycle. It is especially hazardous for persons exiting a store or business directly into the path of a bicycle. Third, intersections pose a significant hazard to bicyclists especially from right-turning vehicles; although right-turning motorists may be watching for pedestrians in the crosswalk, they may not see the bicyclist traveling at a higher and unexpected speed through the intersection.

7.1.4 Design Guidelines

There are various items to be considered when installing a bicycle lane. One of the first decisions to be made is the width of the bicycle lane. A bike lane should be at a minimum 4' wide with 5' being preferred. Generally, the higher the speed of the roadway facility the wider the bike lane needs to be. Wider lanes provide a greater feeling of comfort for the cyclists using the facility. Figure 7.1.1 illustrates bicycle lane widths versus posted vehicle speed limits.

The width of multi-use paths also needs to be considered. The use of the path and the expected volume of users need to be considered. Most pedestrians and bicyclists prefer a hard surface while equestrian users and some joggers prefer a soft surface. Wider paths are preferred when high volumes are expected. If a very high volume of users is expected, it may be necessary to separate the two travel directions by a small median. Figure 7.1.2 shows recommended path widths for various volumes of users.

When striping a bicycle lane decisions need to be made on how to handle the interaction between vehicles turning right and bicyclists. When no exclusive right turn lane for vehicles is provided, it is recommended that the bike lane be a dashed rather than solid line beginning 200' from the intersection. When exclusive right turn lanes are provided the bike lane should go between the right turn lane and the inside through lane. As the bike lane crosses the beginning of the right turn lane dashed striping should again be utilized. These concepts are illustrated in Figure 7.1.3, which shows various options for striping bicycle lanes on streets with and without on-street parking.

The striped line between the edge of the right vehicle travel lane and the bicycle lane should be 6" wide as opposed to the typical 4" wide, which serves to emphasize the importance of vehicles not crossing the line. The dashed lines used for bicycle lanes should also be 6" wide and should have short dashes about 4' long with 8' between dashes.

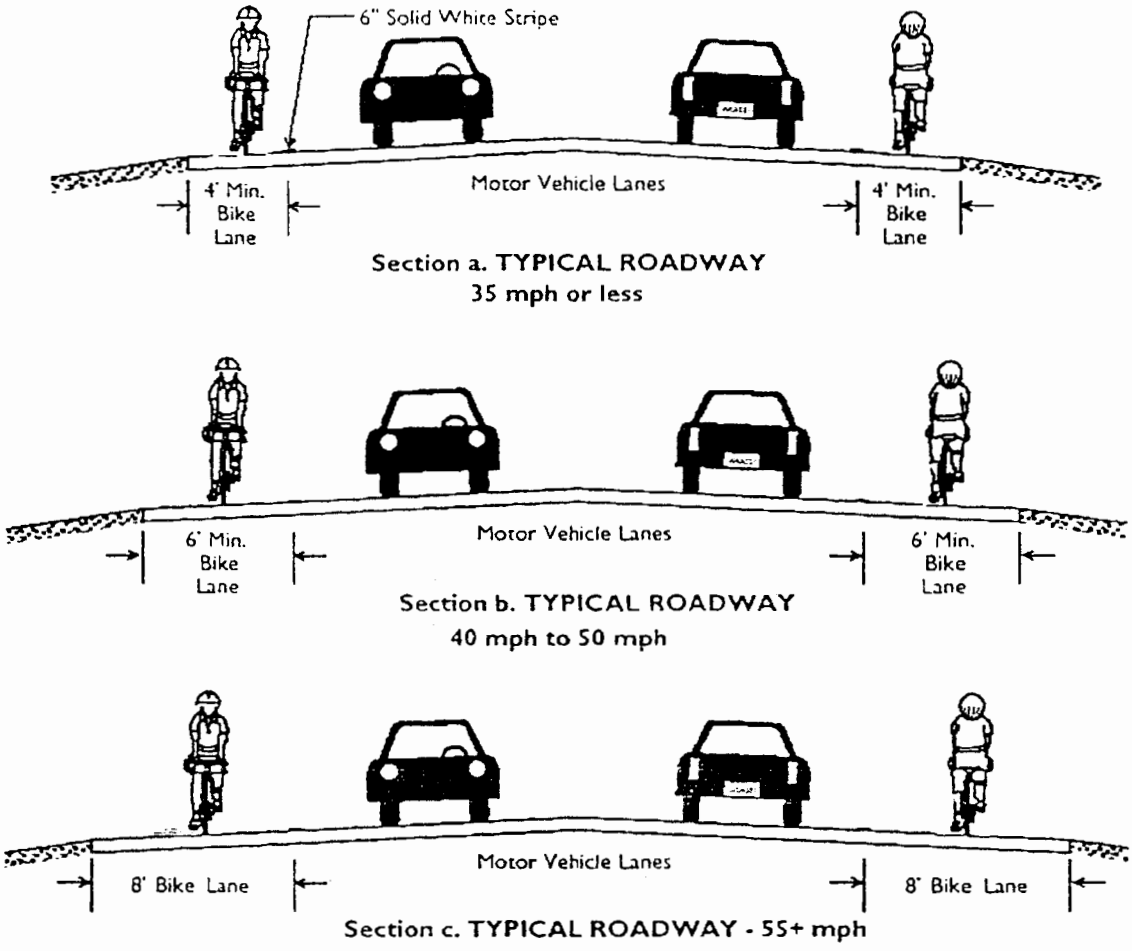
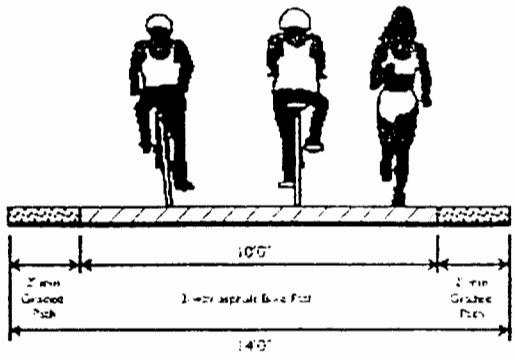
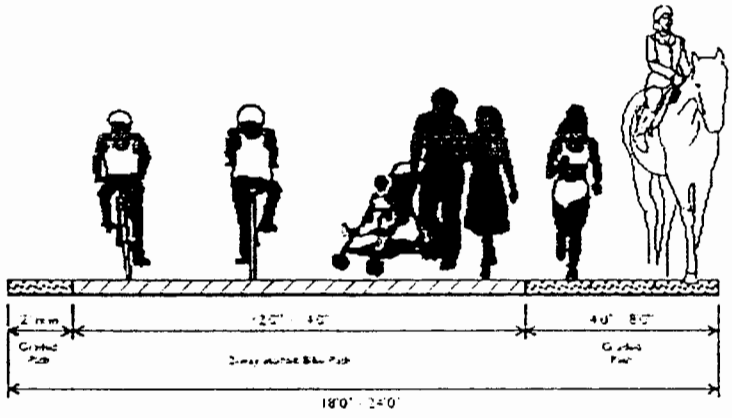


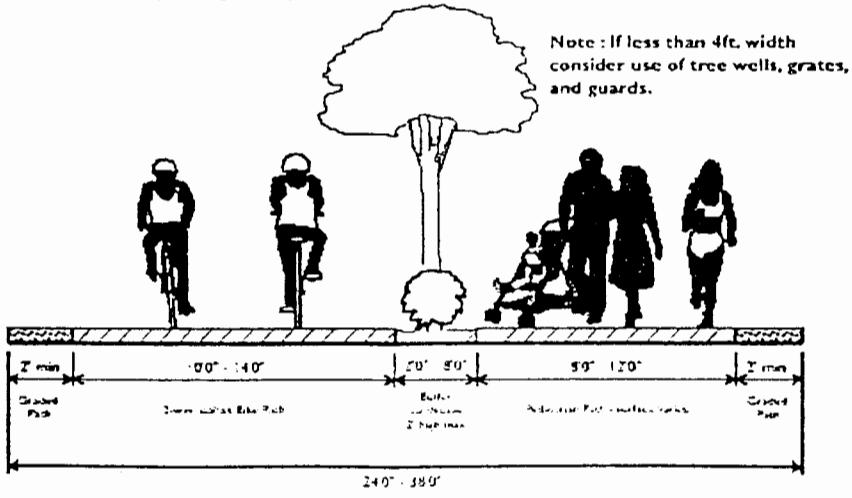
Figure 7.1.1 – Bicycle Lane Widths vs. Posted Speed Limits



1a. BIKE PATH WITH PEDESTRIAN TRAFFIC OF LESS THAN 50 PER PEAK HOUR



1b. MULTI-USE TRAIL - 50 TO 400 PEDESTRIANS PER PEAK HOUR



1c. SEPARATE PATHS FOR BIKES AND PEDESTRIANS MORE THAN 400 PEDESTRIANS PER PEAK HOUR

Figure 7.1.2 – Multi-Use Path Cross Sections

Finance/Administrative Services Department

INTEROFFICE MEMORANDUM

Finance :: Information Technology :: Purchasing :: Water Conservation

TO: Tom Burdett, Wendell Rigby, David Hales, Tim Peters, Tom Steele, Gary Luebbers, Julie Hess

CC:

FROM: Stephen Glain

SUBJECT: Utah Rivers Council park strip information packets

DATE: April 24, 2006

In their efforts to promote landscape water conservation, the Utah Rivers Council has been providing information packets to residents throughout Salt Lake Valley with suggestions for planting native/water wise plants in park strip areas (between sidewalks and roadways). Rick Lewis and I have met with Mark Danenhauer, the local Rivers Council representative, and have discussed a similar info packet specifically for West Jordan residents. This version (attached) clearly reminds residents of the need to follow City ordinances and summarizes the City's municipal code requirements for park strips.

This info packet will not be mass-distributed, but the Rivers Council will only mail them to residents who respond to their radio and newspaper ads and specifically request a packet.

The Planning Department has reviewed the packet for consistency with current City codes. Please review this packet, especially the second page (West Jordan Specific Instructions) and let me know this week if possible whether you would have any concerns if a number of residents choose to retrofit their park strips using these guidelines. Thanks for your help.

Utah Rivers Council

Dear Rip Your Strip Pledger,

Congratulations! By taking the "Rip Your Strip Pledge" you've taken the first step towards saving thousands of gallons of water in your own yard and being an example of conservation in your neighborhood. You are also on the way to saving money on your water bills.

This packet is designed to give you the instruction, examples, incentives, and confidence that you'll need to convert your traditional parking strip into an exciting and beautiful example of what low water-use landscaping can be.

By following the steps outlined in this packet, you can rip your strip and start saving water—but you don't have to stop there. Once you are familiar with low water-use landscaping and have a successful parking strip project under your belt, we hope you continue to apply these principles to a larger part of your yard.

Thanks for supporting the Utah Rivers Council's Rip Your Strip campaign. We hope you find this information useful, and follow through on your pledge to rip your strip.

Remember every drop you save helps protect our rivers!

Most important of all - Have fun!

Best of luck,

Mark Danenhauer
River Solutions Coordinator
Utah Rivers Council

Utah Rivers Council

West Jordan Specific Instructions

This sheet of information and instructions has been provided to residents of the City of West Jordan to provide more useful information and guidance to Rip Your Strip. Please follow the below steps prior to completing the steps in the packet.

1. The main points of the City Ordinance relating to parking strips for the City of West Jordan have been summarized and are on the BACK. When designing and planting your parking strip ensure that your parking strip is compliant with the city ordinance. If you have any questions about the city ordinance call City Planning Department at the phone number below.

2. Trees cannot be planted or removed from parking strip without permission from the Urban Forester. Call (801)569-5100 for help regarding approved tree species for the park strip, or see the website information below. Permission is not needed to replace other plant material (grass, etc) with water-wise plants as long as the new design meets City codes.

List of Useful Phone Numbers:

City Planner	569-5060
Urban Forestry (For tree removal or planting)	~~569-5100~~ 569-5703
General information line -	569-5000
Water Conservation Technician	569-5156

List of Local Nurseries & Landscaping Rock Stores

Glover Nursery	562-5496
State Stone	262-9323

rip your strip

Introduction

You've probably heard the word "xeriscaping," but what does that really mean? Put simply, Xeriscaping is landscaping that uses less water. Xeriscaping uses drought-tolerant plants, practical lawn areas, efficient watering systems, mulches, and proper maintenance to obtain impressive water savings.

Notice the spelling: xeriscaping. So many times we hear the word and think it's zero-scaping. We may have images of desolate fields of rock or scraggly cacti. While those kinds of landscapes do indeed use less water and may be appropriate in some situations, xeriscaping is not zero-plant, zero-color *zero*-scaping. When done right it is lush, colorful, and full of interesting smells and textures.

The difference between a beautiful xeriscape and a desolate zero-scape lies in the planning process. For that reason, we've compiled this workbook with all the information you'll need to plan the perfect parking strip.

Just start from the beginning of this step-by-step workbook and fill in your own information as you go. There are **9 STEPS** in this workbook. Each step will have a brief objective, followed by a summary of that step's objective and ACTION ITEM(S). The overviews are to be read, while the ACTION ITEM(S) require you to actually do something, as the name implies.

In addition, a "bonus section" of the Rip Your Strip website is mentioned in several sections. To keep mailing costs down, we've put some information online. In those cases, we give you the web address of these bonus sections. Just type them in your browser and you'll be able to view this extra material. If you don't have access to the internet, call Mark at (801) 486-4776 to have hard copies mailed to you.

Parking strips offer a unique opportunity to get your feet wet in the world of xeriscaping—you can try different methods, see what you like, and prepare to retrofit bigger parts of your yard. Later you can move on to larger parts of your yard to realize more savings, and you'll already be familiar with the techniques and styles that you like.

STEP 2
Make your wish list & prioritize

STEP 2 OBJECTIVE:
Decide what characteristics you want your parking strip to have, and prioritize that list.

OVERVIEW:
If you don't know what you want out of this project, then you won't be satisfied with the outcome. We're not trying to provide a one-size-fits-all parking strip solution to everyone. Your own design will be as unique as you. Some people want lots of color. Others may want extreme low-maintenance. And some may want a parking strip that would never have to be watered once it was established. Knowing what you want before you start planning makes future decisions a snap and helps you feel satisfied when it's all done.

ACTION ITEMS
2.1: List your broad goals for your parking strip
2.2: Prioritize a list of desired parking strip characteristics

ACTION ITEM 2.1
Use this space to put some of your overall goals for your parking strip in writing. The following questions should get you thinking:

- What do you like *most* about your current parking strip?
- What do you like *least* about your current parking strip?
- If you could change one thing about your parking strip, what would it be?
- What characteristics does a "good" parking strip have?
- Who has a parking strip you like? What is it that makes you like it so much? What would you change about it?
- If you had your ideal parking strip, how would someone walking by describe it?

ACTION ITEM 2.2
Using the answers from Action Item 2.1 as background, prioritize a list of characteristics you'd like your new parking strip to have. For a sample list of characteristics, see the bonus section of the Rip Your Strip website at www.ripyourstrip.com/step2

Salt Lake City has a very specific parking strip ordinance, which states that parking strips must have at least 33% of the area covered in vegetation, measured after three years of plant growth. It also limits groundcovers and continuous plantings to 18", and accent plants to 36" tall in order to preserve sight lines from a driveway. Barbed and thorned plants are prohibited, as is concrete or mortar on parking strips with trees or those wider than 24 inches. If you live in Salt Lake City, please read the entire ordinance at a Rip Your Strip website bonus section www.ripyourstrip.com/slcordinance

If you live outside of Salt Lake City, please contact your local city or township government to verify their ordinance. We've compiled a list of contact information for a few cities in Utah. Access it at www.ripyourstrip.com/cities

ACTION ITEM 3.2

The following pages contain sample parking strip designs done by local landscape designers who are very familiar with xeriscaping principles and Utah's semi-arid climate. Each one is 20' long by 4' wide. Many parking strips are wider, some narrower. These designs can be adapted to fit your needs. If your parking strip is 40' x 4', just repeat the design twice. If it's 20' x 6', just stretch the design and add a few more plants. Feel free to experiment a bit, or make your very own design from scratch.

Design 1- Full sun, mostly plants, extremely drought tolerant
Waterwise Design & Landscapes, L.C. (801) 274-6580 | waterwise-utah.com

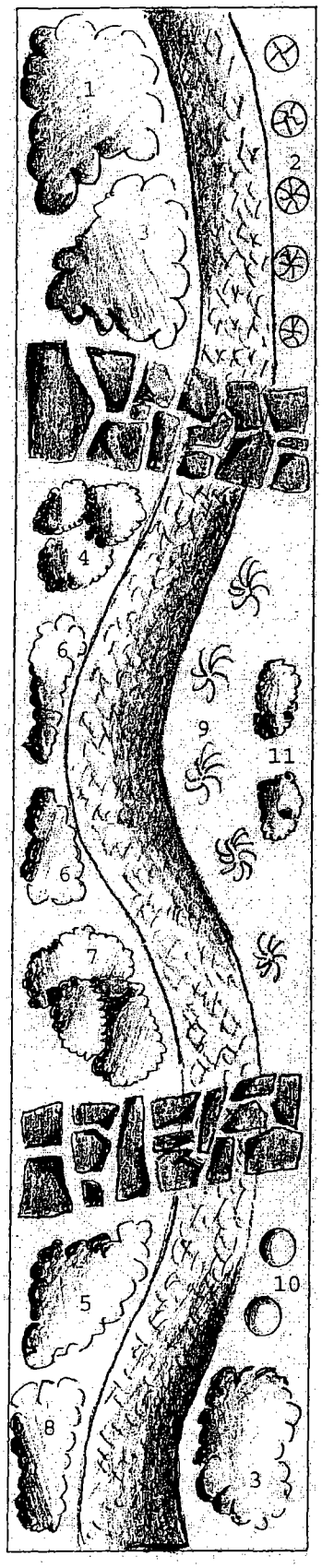
Design 2- Full sun, plant/non-plant mix, moderately drought tolerant
Sage's Way Landscape & Design (801) 573-8934 | sagesway.net

Design 3- Full sun, mostly plants, moderately drought tolerant
Hortica Design, (801) 558-0875 | hortica.imagedancer.com

Design 4- Shade, existing trees, moderately drought tolerant
Hortica Design, (801) 558-0875 | hortica.imagedancer.com

Design 5- Full sun, mostly plants, moderately drought tolerant
Hortica Design, (801) 558-0875 | hortica.imagedancer.com

Design 2



SAGE'S WAY
LANDSCAPE & DESIGN
428 J St Salt Lake City, Utah 801-573-8934
www.sagesway.net

Description:

A meandering swale of small and medium size rocks (fist size) with mulched and slightly raised beds on either side. Two flagstone pathways on level with the side walk.

Total area = 80 sq ft.
1" = 2 ft

Flagstone = 12 sq ft x 2 in. deep = 240 lbs.
Sand = 12 sq ft x 2 in. deep = 240 lbs.
Gravel = 45 sq ft x 2 in. deep = 500 lbs.
Mulch = 30 sq ft x 2 in. deep = .25 cubic yards

Plant Lists

1. common thyme
2. blue fescue
3. Lambs ear
4. Wooly yarrow
5. Sedum – dragons blood,
6. Nepeta – catnip
7. Alyssum- basket of gold
8. Artemisia – powis castle
9. Little bluestems
10. Utah ladyfinger
11. Sulfurflower buckwheat

esign 4

Rip-Your-Strip Parking Strip (partial-shade planting 1)

SOIL PREPARATION

While gardens take shape in a variety of ways, soil preparation is a must. Comprehensive soil preparation serves as the underpinnings in horticulture. Development of suitable soil conditions allows effective management of soil moisture. Like wise, soil fertility can be controlled to suit specific plant requirements.

A general approach for creating favorable soil begins by deeply tilling the soil when it is somewhat moist, not gooey wet. Add and mix in 30% to 40% coarse organic soil amendment. Material called Forest Mulch, Soil Pep, or sometimes Soil Aide (all the same partially composted, ground tree bark) makes an excellent all-purpose organic amendment.

Thorough soil preparation is analogous to building a solid foundation. Attention to detail and diligence in tilling, amending, blending, and grading will result in creating a fertile garden bed.

Stepping Stones

The stepping stones and patio paver stones should all be of solid, dense stone, 3-4 inches thick and 12-30 inches across. The thickness and size of the stones contributes substantially to how stable the stones will be after installation.

Stone paths and open-stone patio/paved areas, are intended to have Dwarf Mondo Grass planted between the stones as a low-growing, evergreen accent. The stone patio/paved areas should be set on a bed of 1-3 inches of sand. After installation, soil should be used to top-dress the area and mixed into the sand and sub-soil where the Mondo Grass is planted. This will enhance the success of the groundcover.

Use of an open-stone path will also buffer soil compaction over existing tree roots for better air and water infiltration into the root zone.

Organic Bark Mulch

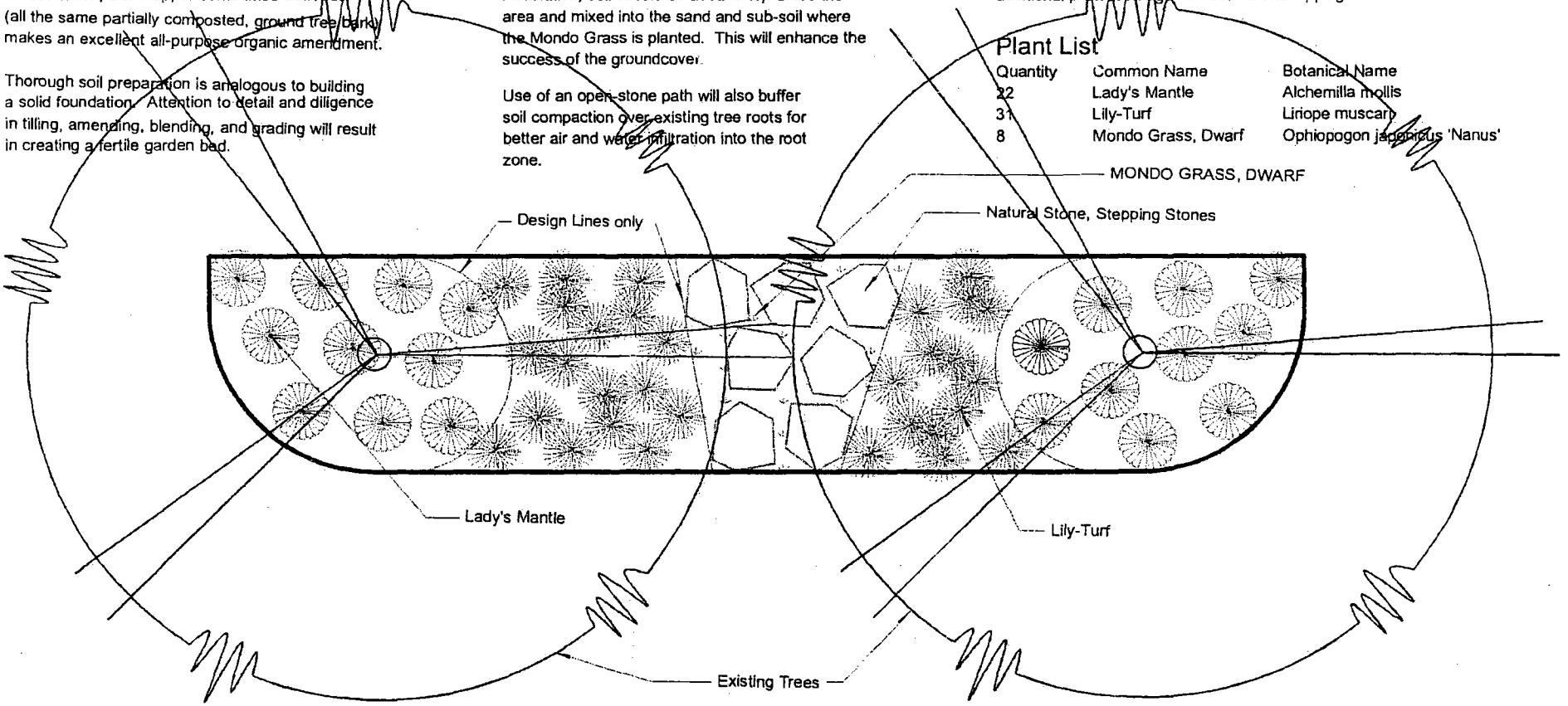
Bark mulch should be spread evenly around plants to a depth of 3-4 inches, taking care not to bury small plants. Medium-size mulch usually stays in place well and achieves a pleasing aesthetic look.

Mulch should be placed around all trees, shrubs perennials and against all bed edges where there is no groundcover. Take care not to bury groundcover if a thin layer of mulch is applied.

Cover all drip tubes with mulch for esthetics and additional protection against foot fall and tripping.

Plant List

Quantity	Common Name	Botanical Name
22	Lady's Mantle	Alchemilla mollis
31	Lily-Turf	Liriope muscari
8	Mondo Grass, Dwarf	Ophiopogon japonicus 'Nanus'



Hortica Design
3631 South Carolyn
Salt Lake City, UT 84106
Phone: 801-558-0875
Email: hortica@imagedancer.com
WEB: http://hortica.imagedancer.com

Services:
Creative Garden Photography • Innovative Garden & Landscape Design
Xeric, Native & Specialty Gardens • Water Features • Garden Lighting

Prepared For: Utah Rivers Council
Prepared: May 5, 2005
Designed By: *Marv Poulson*

Drawing Title: Parking Strip w/existing mature trees (partial-shade planting 1) - 4 ft. X 20 ft.

Rip Your Strip Program

ACTION ITEM 3.3

Time to plan! If you're using one of the plans provided, then you're probably close to done with Step 3. Feel free to make adaptations for parking strip size or plant substitutions if you wish.

If you're making your own plan, here are some considerations:

Plants- Drought tolerant plants are mostly *perennials,* or plants that live through the winter and rebloom every year. *Annuals,* or plants that die at the end of autumn, never get really well-established roots and typically have higher water requirements.

For a great database of waterwise plants for Utah, see waterwiseplants.utah.gov. Click on "Search" to search by plant size, flower color, sun exposure, drought rating, bloom season, etc. The State of Utah has done a nice job on this website.

Choose plants that work for your needs. If your strip bakes in the sun, choose full sun plants. If you get a lot of snow (with salt) piled on it the winter, choose tough, salt-tolerant plants. Use varying heights as allowed by your ordinance. Look into the maintenance requirements of each plant. If you're after hummingbirds or butterflies, plan accordingly. Call nurseries to see if they carry the plant you're after. Most should be locally available; more and more drought tolerant varieties are becoming available each year. Don't be afraid to ask a nursery professional about plants, or research it online.

Non-Plants- Why not use stone or decorative rock? They're pretty cheap, but if you don't want to haul them around, don't put them in your plan. Large rocks should be used as accents, not as the bulk of the design.

Maintenance- This should be a major factor in your plans. Look at the characteristics of plants you select. Do they require much maintenance? Will you constantly be hacking them back from the sidewalk?

Colors- What colors look good with your home and current yard? Try fixing in on one or two accent colors, with a third background color. Don't forget that leaves also provide color, not just blooms. Some beautiful colors never flower.

Seasons-Bulbs are great for spring, but plan for color all year round. Coordinate so that as one plant fades from bloom, another is just beginning.

Nature vs. Soldiers- Nature grows plants in clumps and wavy lines, not in straight lines like a soldier. If you like a more natural look, avoid rows. If you like a formal look, then straight lines help accomplish that.

It's time! Get out a piece of paper, and draw your current parking strip dimensions. Graph paper makes creating a scale model easier. Look at your list of characteristics, the plants you like, and your ordinances...and make your plan!

list of member utilities notified for your proposed excavation site. Blue Stakes also encourages contractors to notify nonmember facility owners."

Source: http://www.bluestakes.org/pdfs/ExcavatorGuide.pdf

For more information about utility service location services or to schedule service, see www.bluestakes.org or call 1-800-662-4111.

ACTION ITEM 4.3
Get ripping! If you have large amounts of grass, plants, weeds or trees you are removing you may want to contact your local city government. Many municipalities have dumpster programs, where you pay a nominal fee for a dumpster rental, and they will deliver and pick up the dumpster for you. Most parking strips probably don't generate enough waste themselves to make getting dumpster (from the city or other private dumpster service) worthwhile, but paired with other neighbors or other projects in your own yard, it could be a good option.

If a dumpster is too much, regular garbage will do. Better yet, why not compost? All that great material would make an excellent addition to any compost pile (weeds excluded).

If you are removing grass:
OPTION A
The best and most direct way is with a shovel and some hard work. Depending on the root depth of the grass, digging out your lawn can be tiresome, but it does ensure that the grass is really gone.

Start by cutting a line across the grass, with a shovel. Cut deep enough that you can wedge the shovel in the line and underneath the grass, to lift the lip of the grass up. Now grab the lip of the grass and pull back and away from the ground at about 45° angle. With some effort, the grass should "peel" back off of the ground like pulling a sticker away from its backing.

If you can't "peel" the grass away, you may just have to cut out small sections at a time. Using a shovel, cut out small portions of grass and lift them out. In all cases, make sure you shake the pieces of grass thoroughly to put as much soil back in the parking strip as possible.

There are also sod cutting machines that do this very thing available for rental, however they are sometimes difficult to operate and may be impractical in such a small area as your parking strip. If you have a extremely large parking strip, or are removing the lawn in a larger part of your yard at the same time as you're doing your parking strip, renting one of these machines may be advantageous. Most major equipment rental outlets have them available.

OPTION B
If the direct removal of grass doesn't appeal to you, perhaps you can let mother nature do the work for you. Remember when you were a kid and you would leave your "kiddy pool" out on the lawn in the summer? After a few days, you go and move it, and the grass underneath is a different color. If left long enough, that grass would die completely.

STEP 5:
Set Up Sprinklers

STEP 5 OBJECTIVE: Set up your sprinkling system (if you have one) to water your new parking strip appropriately.

OVERVIEW: If you have a sprinkling system, you may have to make some changes. Decide whether you can modify a current sprinkling system and how, or how else you might water your new parking strip. See "Watering" under "STEP 9- Maintain" for more details.

ACTION ITEMS
5.1 Decide how you will water your parking strip and make necessary changes

ACTION ITEM 5.1
Question 4 in Action Item 1.2 asked you to see how your parking strip was currently being watered. If you haven't yet made that determination, do so now.

<u>If You Don't Have a Sprinkling System</u>
If your parking strip doesn't currently have a sprinkling system, then you have the easiest transition. Once your new plants are established (after the first year), you'll still have to water your parking strip by hand, but only once or twice a month. Those who have selected the extremely high drought-tolerant option (Plan 1) won't have to water at all once the plants are established.

<u>If You Have a Sprinkling System that
DOES Water the Parking Strip Exclusively as its Own Station</u>
You have three options:

Most sprinkler clocks are not sophisticated enough to water one station on a "once or twice a month" basis, and the rest of the stations once or twice weekly. If yours is capable of this, your first and best option is to adjust the clock to accommodate the new strip's low water requirements.

Your second option is to replace your old sprinkler timer box with one that can run two different kinds of programs. Orbit Irrigation (a Utah-based company) makes several different models with this capability—you set a Program A (the rest of the yard) and a Program B (your parking strip). These programs are independent of each other, and are flexible enough to water just once every 28 days. The Orbit Professional Dial Star is one example. For more, see <u>www.orbitirrigation.com</u>.

Your third option is to just leave the sprinklers in place and manually run the parking strip station only when it's needed. You can either leave the same kind of sprinklers in place, or you can retrofit the sprinklers in you parking strip with drip irrigation. In either case, you'll end up

STEP 6:
Prepare Soil

STEP 6 OBJECTIVE: Get the soil ready for planting.

OVERVIEW: Drought-tolerant plants have different soil preferences than traditional plants. Before you plant, you have to know what kind of soil you have, and what kind of soil you'll need.

The ideal soil is loose enough to breathe and drain well. It's a mixture of sand, silt and clay—three different kinds of soil. Drought tolerant and Utah native plants may not require "high quality" soil, but good draining soil helps ensure that more water gets into the ground and less runs off the parking strip into the gutter.

ACTION ITEMS
6.1 Determine what kind of soil you have.
6.2 Determine what kind of soil you will need.
6.3 Treat, amend, or otherwise adjust the soil as needed.

ACTION ITEM 6.1
The best way to determine your soil type is to have it tested. Home test kits are notoriously inaccurate, so we recommend sending away for the test. Utah State University does an excellent and affordable test that gives a great baseline for soil type as well as some chemical composition. Just fill out their form, send it with a soil sample, and within a few weeks you'll have your results.

USU Analytical Laboratories
www.usual.usu.edu
(435) 797-2217

USU Soil Test Form
http://www.usual.usu.edu/forms/soilform.2003.pdf
**Make sure that on line 5 of "Crops to be Grown" under "Lawn · Garden · Orchard" you write in "Xeriscaping."
**You probably want the "Routine" test for $14.00.

If you don't want to pop for the soil analysis, there are some basic tests you can do to check your soil. To test for drainage, dig a hole about a foot deep and fill it with water. If there's still water in the hole 12 hours later, your soil needs some help to enhance drainage. See Action Item 6.3 for ways to help the soil.

For a more detailed do-it-yourself soil analysis, see Palmdale (CA) Water District's Xeriscape website at:
http://www.palmdalewater.org/YW/XS/step2b.html

STEP 7:
Plant & Install

STEP 7 OBJECTIVE: Install your new parking strip right to ensure success!

OVERVIEW:
It's been said that you should dig a $20 dollar hole for a $2 plant. That's good advice. This section will help define a $20 hole, and help you install a parking strip that will last.

ACTION ITEM
7.1 Purchase plants
7.2 Add non-plant materials
7.3 Properly plant plants!

ACTION ITEM 7.1
It's time! You've planned, prepped, and ripped. Time to head to the nursery for your plants.

You should have a list of each plant that you need, and how many of each you'll need. Bring it with you to the nursery—or it's game over. Once you're in a nursery, you can become like a kid in a candy store, picking randomly "one of those" and "two of these."

Plant Size:
Buying bigger plants means you have to wait less time to see your parking strip really fill in. It also means more money. Here's a simple equation: size=money. If you don't mind waiting a few years for things to fill in, go with the smallest size available. Smaller plants need more attention at first, as their roots are small and can't survive long without proper watering, but they'll save you a bundle.

You may also want larger plants if you're worried about foot traffic. Someone might trample right over a small plant, but step around it if it's got some girth.

You may want to review your local ordinances before heading to the nursery. Besides prohibited plants and restrictions on plant quantity and characteristics (discussed in Step 3), some ordinances may require a certain size of plant or caliper of tree/bush be planted.

Plant Quality:
If you find a plant that you think is questionable, it's probably best not to buy it. It may be inexpensive and you may be tempted to "nurse it back to health," but more often than not it's already on an irreversible course to the garbage bin.

For a guide on how to buy healthy plants, see a bonus section of the Rip Your Strip website at www.ripyourstrip.com/buyplants

STEP 8:
Mulch

STEP 8 OBECTIVE: Choose and distribute mulch to applicable parking strip area.

OVERVIEW: Mulch is an important part of any water-wise landscape. Choosing the right mulch is largely personal preference, but using it right means your new parking strip will be extra water-wise.

For a GREAT reference sheet on mulches, see USU's "Using Mulches in Utah Landscapes and Gardens" at: http://extension.usu.edu/files/gardpubs/compos04.pdf

ACTION ITEM
8.1 Choose what kind of mulch you'll use.
8.2 Apply mulch.

ACTION ITEM 8.1
Put simply, "mulch" is any material that is put on the surface of soil and not worked into the soil. Often used examples are chipped or shredded bark, peat moss, lawn clippings, gravel, or decorative stone. Synthetic materials are also used as mulch. Plastic weed barriers or weed fabric could be defined as mulch as well.

Mulch has many purposes. First, it helps retain moisture in the soil. When water gets to the top of the soil, mulch is a protective layers that keeps it from evaporating as quickly, which keeps the soil a bit damp. This helps prolong the time between waterings.

Mulch also helps water percolate into the soil. Imagine walking across the same stretch of soil over and over again. Pretty soon, you'd have a near bullet-proof soil crust that actually couldn't absorb much water. Using loose mulch you can protect the soil crust from hardening, thus maintaining its capacity to absorb water. The exception to this use is sheets of plastic which don't allow percolation.

In addition, mulch encourages plants to root nearer to the surface which makes them healthier, protects the base of plants, suppresses weeds, and moderates soil surface temperatures; it's an important component of any landscape. As always, check your local parking strip landscaping ordinance for possible restricted mulch materials.

For a GREAT reference sheet on mulches that will help you decide which kind is right for your parking strip, see USU's "Using Mulches in Utah Landscapes and Gardens" at:
http://extension.usu.edu/files/gardpubs/compos04.pdf

STEP 9
Maintain

STEP 9 OBJECTIVE: Identify maintenance needs for your new parking strip, and form maintenance plan.

OVERVIEW:
Maintaining a xeriscaped yard and maintaining a traditional yard are two very different tasks. Your new parking strip will have very different maintenance needs than your old one; its own needs will be different this first year than in subsequent ones. Making a plan will help keep your parking strip beautiful.

ACTION ITEM
9.1 Make watering plan.
9.2 Make general maintenance plan.

ACTION ITEM 9.1
All plants, even the most drought tolerant, require frequent watering when they're new. Their roots have been stressed in transport and in transplant, so they need time to get established in their new home. For the first few weeks, you should pay close attention to your plants. The smaller ones may need water every day; the larger ones every couple of days. After that, try to extend the time period between waterings, until you've eventually reached the target of once a twice or month—or even never. This may not happen in the first season, but after their first winter, your plants should be well-established.

It may sound corny, but you should actually create a schedule for the times you'll water and check up on your strip. Perhaps every day when you come home from work, or each morning when you go out to get the paper. Just give it a quick once-over. As your plants change and mature, so should your plan.

Watch your plants for signs of distress—especially wilting or yellowing. If you see them wimping out, water a bit more often. Caught early, water stress can be reversed, but once leaves and stems become crispy, the plant just shuts down. Keeping an eye on your new plants will help ensure that they become strong and independent later on.

ACTION ITEM 9.2
Xeriscaping is a whole new ball game when it comes to maintenance. Gone are the days of Saturday morning mowing and trimming (at least in your parking strip). Your maintenance will depend largely on the kinds of plants you installed, how much non-plant material you used, and other factors you considered while planning. While xeriscaped yards may actually be more labor-intensive to maintain, most are usually not. Typically, you'll have a big spring cleanup and another in the fall. Your summers will be relatively low-maintenance, leaving you free to go out and enjoy Utah's renowned rivers!

Watering Trees in Your Low Water Use Landscape

Trees can make a wonderful addition to any landscape—they provide shade, shape, and a sense of age and prestige to a landscape.

Their water needs are very different from the rest of the yard. As we shift to water-wise landscaping, trees can suffer without adequate water. This sheet should provide a basic outline of how to efficiently water trees while still conserving water.

HOW MUCH SHOULD I WATER?

Generally speaking, you should water a tree so that the soil gets wet to a depth of about 18 inches. In practice, you'll need to become familiar with your situation (soil type, tree requirements, etc.) in order to apply water to that depth.

WHERE SHOULD I WATER?

Remember the saying, "trees aren't carrots." Tree roots don't grow straight down, they can spread 2-3 times the height of the tree. Its absorbing roots are usually in and around the dripline—the area around a tree where water falling off its leaves would land. In general, the dripline and the areas surrounding it are the best places to focus your watering.

HOW SHOULD I WATER?

Drip irrigation works well on trees less that 4" in diameter, but loses effectiveness on larger trees. If your sprinkling system is built to water tree areas exclusively, use it to apply water. Otherwise, a hose-end sprinkler will do the trick.

HOW LONG SHOULD I WATER?

This depends largely on what type of soil you have. Remember the rule of 18" deep. If you have sandy soil, you may be able to get water that deep in one application. If your soil is more clay, you may have to water for 10 minutes (or until the water starts to run off the soil surface), let the water soak in for half an hour, water for 10 minutes, let it soak in, etc. The best way to check if you've watered long enough is to probe the soil down to 18" and see if it's moist.

HOW OFTEN SHOULD I WATER?

Most trees require this deep watering once or twice a month, depending on the type of tree and the weather conditions. Watch your trees for signs of stress. Is it wilting, yellowing, browning, dropping needles or leaves out of season? Does is have leaf scorch, darkened veins, or smaller than normal leaves? While this isn't an exhaustive list of symptoms, nor are they exclusive to water issues, if these signs show up in your trees it may be a signal that they're being under-watered. Careful, though. Overwatering can produce some of the same symptoms.

WHEN SHOULD I WATER?

In Utah, the semi-arid climate and dry summers make watering trees more important. Typically the winter rains and snows provide enough moisture for trees. However, during especially dry winters you may need to water your trees once or twice.

WHAT KIND OF TREES SHOULD I PLANT?

Planting the right tree to begin with can help prevent problems before they begin. The list on the back of this sheet shows the approved and non-approved trees for park strips in West Jordan City.

Low water use landscapes save water and ease the pressure on our rivers, but they change the watering patterns your trees are used to. By properly watering trees you can ensure they're strong, healthy, and enjoyed for years to come. Remember, it takes 20 years to replace a 20-year-old tree!

Utah Rivers Council
1055 E. 2100 S. Suite 207
Salt Lake City, UT 84106
www.utahrivers.org

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www.blueskyperennials.com