



PART FOUR: WALL & FENCE DESIGN GUIDELINES

4.1 GENERAL

All wall and fence design and construction shall be in compliance with the City standards and guidelines and the 'Uniform Building Code'. When walls or fences are constructed within public use areas, design and construction shall comply with the current edition of 'Standards for Public Works'.

4.2 WALL DESIGN

4.2.1. Walls: Walls shall be designed to utilize decorative block such as split face, Burnished CMU, stucco finish, stone or brick veneer, or a combination of materials.

Walls shall be designed to include accent pilasters, accent courses, and project entry monuments (when applicable). Walls shall utilize materials as specified by the wall master plan (Appendix Two). Builders are encouraged and may be conditioned by the City to utilize decorative materials, pilasters and planters at project entries.

4.2.2 Wall Caps: All walls shall be designed with cap materials that provide a 1" to 3" overhang on each side of the wall. Acceptable cap materials are: pre-cast decorative concrete caps, brick, split face block caps, or stone caps. Mortar caps are not acceptable.

4.2.3 Columns/Pilasters: Walls shall be designed to include columns/pilasters at corners and accent points positioned intermediately. Intermediate columns/pilasters shall be a minimum of 18" square and columns/pilasters at corners or accent locations shall be a minimum of 24" square.

Intermediate columns/pilasters shall occur at the lot line of residential lots and shall be placed at the line of every two lots. An offset of 2' to 4' may occur intermediately.

Columns/pilasters at corners or at accent points shall be designed with stone or brick or manufactured stone materials or an accent block.

4.2.4 Conner Accents: Corner walls at residential tract entries shall be designed to use stone, brick, tile, stucco, or decorative block or a

combination of materials. Corner walls may include raised planters. The use of fountains in CFD/LMD areas is discouraged.

- 4.2.5 Refer to the wall design illustrations. For walls occurring along streets that have standards set by the 'Parkway and Wall and Fence Master Plan', see Appendix Two.
- 4.2.6 Residential street-facing side yards shall be enclosed by a 6' high masonry wall. The end of the wall shall terminate with a pilaster.
- 4.2.7 A block wall shall be placed at the rear property line of lots that back onto open space areas or parks. When residential lots that back onto an open space or a park have a slope that places the park 6' or more below the lot elevation, tubular steel view fencing may be incorporated.
- 4.2.8 Walls and fences shall be a minimum of 6' high and shall not be taller than 7' unless required to meet sound mitigation requirements. Walls that exceed 7' in height must be offset with an intermittent planter area of no less than a four feet in width.
- 4.2.9 Walls and fences that face onto a street, park, or public area must be designed to have a four foot wide landscape planting area.
- 4.2.10 Wood fences shall be installed with galvanized steel posts.



PART FIVE: STANDARD PLANT LISTS

5.2.1 GENERAL

It is the intent of the City to retain the character of the community's rural agricultural roots. Street trees shall be designed in clusters or groups of alternated street tree species. Tree spacing shall vary and formal plantings shall be avoided.

Shrub and groundcover plantings shall be designed to create a flowing informal look. Plant selection and spacing shall not need regular or formal hedging and minimize maintenance. Water wise planting is desired whenever possible.

When varying landscape conditions interface, such as a parkway and slope or a parkway and retail/commercial, the planting shall be designed to blend the two landscape types together, providing for a cohesive appearance.

5.2.2 PLANT SUBSTITUTIONS

Plant materials for projects should be selected from the following lists. If additional plant materials, which are not listed, are desired, a formal request must be submitted to the City Landscape Architect. Upon review, the request will be accepted or rejected. Plant material substitutions for street trees will not be accepted.

5.3.0 ABBREVIATIONS

ABBREVIATIONS	DEFINITION
<u>TREES</u>	
ST	Use tree for street planting in parkways and landscape setbacks
MD	Designates use of tree for streetscape medians
SL	Use tree for slope and erosion control plantings
PK	Indicates tree to be used for park planting
CO	Use tree at commercial projects
PL	Use tree for parking lots
SC	Tree can be used for screening
FY	Tree is designated for front yard use
AC	Tree can be used for accents at project entries, corners, signage and so forth
Varies	Refer to the 'Parkway and Median Master Plan' or guidelines for tree sizes.
<u>SHRUBS</u>	
FG	Foreground
MG	Mid-ground
BG	Background
SC	Screen
SL	Slope
FY	Front Yard
<u>GROUNDCOVER</u>	
MD	Median
PW	Parkway
ROW	Right of Way
CM	Commercial/Industrial
SL	Slope
FY	Front Yard

5.4.0 TREES

BOTANIC NAME	TREE CLASSIFICATION							
	ST	MD	SL	PK	CO/PL	SC	FY	AC
Acacia stenophylla			15 gal					24" box
Alnus cordata	15 gal			varies				
Alnus rhombifolia	15 gal			varies				
Albizia julibrissin	varies		15 gal		24" box			
Arbutus unedo		24" box	15 gal				15 gal	
Arbutus 'Marina'		varies	15 gal		24" box			
Arecastrum romanzoffianum	12' bth	12' bth					8' bth	varies
Brachychiton populneus	varies				24" box	15 gal		
Brahea edulis	12' bth	12' bth					8' bth	varies
Calodendron decurrens				varies		15 gal		
Cedrus deodara	varies	varies		varies				
Cercis occidentalis		24' box	15 gal					
Chamaerops humilis		varies		varies				varies
Chionathus retusus		varies			24" box		15 gal	
x Chitalpa tashkentensis	varies	varies	5/15 gal		24" box		15 gal	
Chorisia speciosa				varies				varies
Cinnamomum camphora	varies	varies		varies				
X Cupressocyparis leylandii						15 gal		
Cupressus sempervirens				varies	varies			varies
Eriobotrya deflexa		varies				15 gal	15 gal	
Eucalyptus nicholii	15 gal		5 gal			15 gal		
Eucalyptus rudis	15 gal		5 gal			15 gal		
Eucalyptus sideroxylon	15 gal		5 gal			15 gal		
Fraxinus angustifolia 'Raywood'	varies			varies		24" box		
Geijera parviflora		varies				15 gal		
Gleditsia triacanthos	varies				24" box			

BOTANIC NAME	TREE CLASSIFICATION							
	ST	MD	SL	PK	CO/PL	SC	FY	AC
Ginkgo biloba	varies	varies		varies	24" box			varies
Koelreuteria bipinnata	varies	varies	15 gal	varies	24" box			
Lagerstroemia indica		varies					15 gal	
Lophostemon confertus					24" box	15 gal		
Magnolia grandiflora	varies	varies		varies				
Malus 'Pairifire								24" box
Maytenus boaria						15 gal	15 gal	varies
Melaleuca linarifolia					24" box			
Nyssa sylvatica								varies
Olea europea 'Swan Hill'	varies	varies	15 gal	24" box				varies
Pinus canariensis						15 gal		
Pinus eldarica			5 /15 gal			15 gal		
Pinus halepensis	varies					15 gal		
Pinus pinea	varies				24" box			
Pistacia chinensis	varies				24" box			
Pittosporum phillyraeoides		varies			24" box		15 gal	
Pittosporum undulatum		varies			24" box		15 gal	
Platanus acerifolia 'Bloodgood'	varies	varies		varies	24" box			
Platanus racemosa	varies			varies	24" box		15 gal	Varies
Prosopis chilensis	varies		15 gal	varies				
Prunus x blireiana		varies						
Prunus caroliniana			5/15 gal				15 gal	Varies
Prunus cerasifera 'Thundercloud'				24" box			15 gal	Varies
Prunus cerasifera 'Krauter Vesuvius'				24" box			15 gal	Varies
Pyrus calleryana 'Aristocrat'				24" box			15 gal	Varies
Pyrus calleryana 'Bradford'				24" box			15 gal	Varies
Pinus halepensis	varies		5 gal	varies		15 gal		
Podocarpus gracilior	varies			varies	24" box	15 gal		

BOTANIC NAME	TREE CLASSIFICATION							
	ST	MD	SL	PK	CO/PL	SC	FY	AC
Quercus agrifolia	varies	varies	15 gal	varies	24" box			
Quercus coccinea	varies			varies	varies			
Quercus kelloggii	varies			varies	varies			
Quercus lobata	varies			varies	varies			
Quercus suber	varies	varies	15 gal	varies				
Quercus virginiana	varies		15 gal	varies				
Rhus lancea			15 gal					
Sapium sebiferum	varies	varies				15 gal		
Schinus molle	varies	varies						
Sequoia sempervirens				24" box				
Sophora japonica	varies	varies						
Tipuana tipu	varies	varies						
Trachycarpus fortunei	12' bth	12' bth					8' bth	varies
Washingtonia filifera	12' bth	12' bth					8' bth	varies
Washingtonia robusta	12' bth	12' bth					8' bth	varies
Zelkova serrata	varies			24" box				

5.5.0 SHRUBS

BOTANICAL NAME	USE CLASSIFICATION					
	FG	MG	BG	SC	SL	FY
Abelia g. 'Edward Goucher'		5 gal			5 gal	5 gal
Abelia g. 'Prostrata'	5 gal				1 gal	1 gal
Arbutus unedo 'Compacta'		5 gal				
Acacia redolens	1 gal				1 gal	1 gal
Agapanthus a. 'Peter Pan'	1 gal					1 gal
Agapanthus a. 'Queen Anne'		1 gal				1 gal
Agapanthus orientalis		1 gal				1 gal
Asparagus d. 'Myers'	1 gal					1 gal
Asparagus d. 'Sprengeri'	1 gal					1 gal
Baccharis 'Centennial'		5 gal			1 gal	
Baccharis 'Pigeon Point'	1 gal				1 gal	
Baccharis 'Twin Peaks'	1 gal				1 gal	
Buxus m. j. 'Green Beauty'		5 gal				5 gal
Buxus m. j. 'Winter Gem'		5 gal				5 gal
Berberis 'Atropurpurea'		5 gal				5 gal
Berberis g. 'William Penn'		5 gal				5 gal
Berberis thunbergii		5 gal				5 gal
Camellia sasanqua			5 gal			5 gal
Chaenomeles j. 'Texas Scarlet'		5 gal				5 gal
Cotoneaster dammeri		5 gal			5 gal	5 gal
Cotoneaster d. 'Coral Beauty'		5 gal			1 gal	5 gal
Cotoneaster d. 'Lowfast'	1 gal				1 gal	
Cotoneaster horizontalis	1 gal					
Dietes bicolor		1 gal			1 gal	1 gal
Dietes vegeta		1 gal			1 gal	1 gal
Elaeagnus pugins 'Fruitladii'			5 gal		5 gal	

BOTANICAL NAME	USE CLASSIFICATION					
	FG	MG	BG	SC	SL	FY
Escallonia kompakta		5 gal			5 gal	
Escallonia fradesii			5 gal		5 gal	5 gal
Euonymus japonica			5 gal			
Euonymus j. 'Aureo-marginata'			5 gal			5 gal
Euonymus j. microphylla		5 gal				5 gal
Euonymus j. m. 'Variegata'		5 gal				5 gal
Fatsia japonica		5 gal				5 gal
Feijoa sellowiana		5 gal				
Gardenia jasminoides 'Mystery'		5 gal				5 gal
Gardenia jasminoides 'Veitchii'		5 gal				5 gal
Grevillea 'Noellii'		5 gal			5 gal	
Grevillea 'Canberra'			5 gal		5 gal	
Heteromeles arbutifolia			5 gal		5 gal	
Hemerocallis hybrid	1 gal					1 gal
Ilex c. 'Burfordii'		5 gal				
Ilex c. 'Dazzler'		5 gal				
Ligustrum j. 'Texanum'			5 gal			
Liriope gigantea	1 gal					1 gal
Liriope m. 'Silvery Sunproof'	1 gal					1 gal
Liriope s. 'Silvery Sunproof'	1 gal					1 gal
Leucophyllum frutescens			5 gal		5 gal	
Leucophyllum f. 'Compacta'			5 gal		5 gal	
Leucophyllum f. 'White Cloud'			5 gal		5 gal	
Myrtus communis 'Compacta'		5 gal				
Nandina domestica 'Compacta'		5 gal				5 gal
Osmanthus heterophyllum			5 gal			
Photinia fraseri			5 gal			
Pittosporum t. 'Wheeler's Dwarf'		5 gal				5 gal
Pittosporum tobira 'Variegata'			5 gal			

BOTANICAL NAME	USE CLASSIFICATION					
	FG	MG	BG	SC	SL	FY
Prunus i. lyonii			5 gal			
Puncia granatum		5 gal			5 gal	
Puncia g. 'Nana'	5 gal				5 gal	5 gal
Rhaphiolepis i. 'Ballerina'	5 gal					5 gal
Rhaphiolepis i. 'Indian Princess'		5 gal				5 gal
Rhaphiolepis i. 'Spring Time'		5 gal				5 gal
Rhaphiolepis i. 'Majestic Beauty'			5 gal			
Ribes viburnifolium		5 gal				
Rosmarius officinalis		5 gal				
Rosmarius o. 'Prostratus'	1 gal					
Rosea mediland	5 gal					
Rosea Floribunda		5 gal				
Salvia greggii	1 gal					1 gal
Salvia leucophylla		1 gal				1 gal
Tulbaghia violacea	1 gal					
Viburnum japonicum			5 gal			
Westringia fruitcosa		5 gal				
Xylosma congestum 'Compacta'			5 gal			

5.6.0 GROUNDCOVER

BOTANICAL NAME	MD	PW	ROW	CM	SL	FY
Abelia x g. 'Prostrata'	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Acacia redolens	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Baccharis pilularis	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Fragaria chiloensis						flats
Cotoneaster horizontalis	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Gazania splendens						flats
Hypericum calycinum	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Juniperus (prostrate)	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Lonicera japonica	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Myoporum parvifolium	1 gal	1gal	1 gal	1 gal	1 gal	1 gal
Pelargonium peltatum	4" pots	4" pots	4" pots	4" pots	4" pots	4" pots
Rosmarinus officinalis	1 gal	1 gal	1 gal	1 gal	1 gal	1 gal



PART SIX: CONSTRUCTION DOCUMENT GUIDELINES

SECTION ONE – GENERAL REQUIREMENTS

1.0.0 GENERAL

1.1.1. Licensing, Permits and Insurance

- a. All contractors performing work on the project shall have a current license as required for the construction discipline in which they are engaged.
- b. The contractor shall apply for, pay for and obtain all required permits to construct and complete the project. Permits and inspection cards shall be kept on site and be accessible to City or Agency inspectors upon request.
- c. Contractors working on projects within the City are required to obtain a City business license.
- d. Contractors are required to have on site copies of current insurance certificates for each of the required insurance types. The contractor shall maintain on site copies of the bonds required for the projects.
- e. The contractor shall obtain and pay for all required utility hook ups.

1.1.2. Professional Conduct

- a. All contractors or employees of the contractor working within the City are encouraged to conduct themselves in a professional manner. The use of profanity or vulgar language is strongly discouraged.
- b. Contractors shall work in a cooperative manner with all City or agency officials.
- c. Contractors are expected to work in a cooperative manner with other trades.
- d. It is the responsibility of the contractor to verify requirements for dust control, traffic control and utility installation needed for the project.

1.1.3. Utility Coordination

- a. It is the responsibility of the contractor to verify the location and placement of all existing utilities.
- b. The contractor shall coordinate the installation of irrigation water meters. Water meters shall be installed by a contractor who has been approved by the City to install water meters.
- c. When required, the contractor shall make connection to sewer and/or storm sewer lines. The contractor shall coordinate this work with the appropriate agencies.
- d. All electrical connections to irrigation controllers shall be completed by a licensed electrical contractor.

- e. The contractor shall include within his scope of work the connection of new construction to utilities.

1.1.4. Standards

- a. Specification and plans shall be prepared to be compliant with all governing federal, state, county and city standards; including by, but not limited to, the Uniform Building Code, Standards for Public Works and Americans with Disabilities Act.

1.2.0 PRE-CONSTRUCTION

1.2.1. Preconstruction Testing and Planning

- a. Prior to commencing landscape construction the Owner shall have completed geological soils testing. When rough grading has been completed the contractor shall submit soil samples to a soils lab for landscape planting suitability and soils recommendations.

1.2.2. Approved Plans

- a. Work shall not start until landscape construction plans, water calculations, structural calculations and specifications have been approved by the City.
- b. A set of approved plans shall be available at all project meetings and inspections.

1.2.3. Preconstruction Meeting

- a. For all Park, LMD and CFD projects the contractor or the Owner's representative shall schedule a preconstruction meeting a minimum of two weeks prior to the start of construction.
- b. At the preconstruction meeting the contractor shall present to the City representative copies of the following items:
 1. Copies of all required permits.
 2. Copies of contractors licenses, City business licenses, insurance certificates and bonds.
 3. A list of contractor, subcontractors and Owner's representatives, including emergency contact information.
 4. Copies of approved landscape, building and architectural plans as required.
 5. Copies of the structural soils test and agronomic soils test (completed after rough grading).
 6. Three copies of product and materials submittals and a summary of proposed substitutions.

1.2.4. Submittals and Substitutions

- a. The contractor shall submit to the City at the pre-construction meeting submittals inclusive of product and materials information cut sheets and product samples.
- b. All proposed substitutions shall be identified in writing. The City reserves the right to refuse any and all requested substitutions determined by the City to not be acceptable or equal.
- c. All submittals shall be submitted within 15 days after receipt of executed contract.
- d. The contractor submittal package shall include but is not limited to the following:
 1. Plant material proof of purchase with listed nurseries and material sizes for approval
 2. All soil amendments
 3. Bark mulch
 4. Soil report
 5. Labels for all herbicide and fertilizers used
 6. Hydro-seed mix
 7. Site Amenities
 8. Concrete and asphalt mixes
 9. Irrigation components
 10. Irrigation pressure tests
 11. Seed mixes
 12. Tree ties
 13. Root barriers
 14. Playground components and fall material
 15. Other items as determined necessary

1.3.0. CONSTRUCTION

1.3.1. Construction Quality

- a. Workmanship shall be completed to the highest level of quality of industry standards.
- b. For parks, LMD and CFD areas work shall be completed in accordance with all applicable 'Standards for Public Works', the Uniform Building Code, Uniform Plumbing Code and all applicable codes and regulations.

1.3.2. Inspection and Testing

Irrigation Inspections:

- a. For Parks, CFD and LMD areas the contractor shall request inspections as listed below. The contractor shall provide the minimum notification to the City as listed:

1.	Pre-construction conference	7 days
2.	Grading & Drainage Review	72 hours
3.	Concrete form Work	72 hours
4.	Concrete, flatwork and paving	72 hours
5.	Pressure line installation and testing	72 hours
6.	Controller installation	72 hours
7.	Lateral line and sprinkler installation	72 hours
8.	Coverage test	72 hours
9.	Structures and site amenities	72 hours
10.	Plant installation	72 hours
11.	Maintenance Start	72 hours
12.	60 day Maintenance Walk	72 hours
13.	Final Inspection	7 days

- b. Field inspections will not commence unless record drawings are current and available for observation upon request by the City inspector or City Landscape Architect Owner's representative.

1.4.0 PROJECT APPROVAL

1.4.1. Record Drawings

- a. Record accurately on one set of black and white prints denoting variation in work from original drawings.
- b. Dimension from two permanent points of reference (sidewalks, pavement, curbs, street lights and buildings). Record on as-built drawings daily or as work is performed. All drafting must be clear and legible; dimensions shall be no smaller than 1/4" high.
- c. Show dimensions from the following locations and depths:
1. Point of connection (P.O.C.).
 2. Backflow prevention assembly, master valve and flow sensor.
 3. Routing of irrigation pressure mainlines and all directional changes.
 4. Ball and butterfly isolation valves.
 5. Irrigation control valves.
 6. Automatic controller, rain sensors and electrical conduits.
 7. Sleeves and pull boxes.
 8. Other related equipment (as directed by the City).
- d. Upon completion and approval of record drawing prints, transfer all information to reproducible mylar drawings and provide two additional blue line copies.
- e. Maintain as-built drawings on site at all times. These drawings are subject to inspection at any time.
- f. Make changes to reproducible drawings in ink (no ball-point pen). Erase or use eradicating fluid when revising drawings. Make changes in a manner equal to the original drawings.

- g. Contractor must submit as-built drawings (sepia mylars and two sets of blue lines) to the City a minimum of seven days prior to the start of the maintenance period for approval.

1.4.2. Controller Charts

- a. As-built drawings shall be approved in writing prior to preparing charts.
- b. Provide two controller charts for each controller supplied, showing the area covered by the automatic controller.
- c. The chart shall be a reduced reproduction of the as-built system. If the controller sequence is not legible when reduced, enlarge it to a size that will be legible when reduced.
- d. Charts shall be black line print with a different transparent color used to show area of coverage for each station.
- e. Completed and approved charts must be laminated with plastic 10 mil thick minimum.
- f. Charts shall be completed and approved prior to final inspection of the irrigation system.
- g. Controller access. The City reserves the right to have complete access to the controller clocks for monitoring and controlling system failures. The contractor shall provide the City with two sets of all keys necessary for access to the controller clocks within the designated area. The keys will then become the property of the Owner.

1.4.3. Operation and Maintenance Manuals

- a. Prepare and deliver to the Engineer, prior to the start of maintenance, all required and necessary descriptive material in complete detail and sufficient quantity properly prepared in four individually bound copies. Describe the material installed in sufficient detail to permit qualified operating personnel to understand, operate and maintain all equipment. Each manual shall include the following:
 - 1. Index sheet, stating contractor's address and telephone number.
 - 2. Duration of guarantee period with guarantee forms.
 - 3. List of equipment with names and addresses of manufacturer's local representatives.
 - 4. Complete operating and maintenance instructions on all major equipment.
- b. In addition to the maintenance manuals, provide the maintenance personnel with the instructions for major equipment and show written evidence to the Engineer at the conclusion of the work that this service has been completed.

1.5.0 Project Turn Over

1.5.1 Acceptance

- a. Prior to the City accepting the project the following must be complete:
 1. The City shall have annexed the project into the project CFD or LMD area.
 2. All outstanding construction and maintenance issues shall be complete and approved by the City,
 3. The project design Landscape Architect shall have reviewed the project and submitted a letter to the City recommending that the project be approved by the City.
 4. The City Landscape Architect shall recommend the project for approval.
 5. The City shall be in receipt of the required turn over items.
 6. The City Landscape Architect and Public Works Director shall approve the as-built drawings and controller charts.
 7. The irrigation controllers shall be certified by the manufacturer.
 8. The playground, restroom and other park structures have been approved by the building department and public works.
- b. The contactor is responsible to maintain the project to the highest standard of quality until the project is accepted by the City.

- END OF SECTION -

SECTION TWO - GRADING

2.1.0 GENERAL

2.1.1. Related Documents:

The work of this section shall conform to the "Standard Specifications for Public Works Construction," latest edition, Section 300, except as modified herein.

2.1.2. Scope of Work:

Work of this Section includes all materials, labor and equipment necessary for and incidental to complete all Site Grading, as shown on the Drawings, as is reasonably implied, or as specified herein, including, but not limited to, the following:

Rough grading as shown on the plans, including cut, fill, backfill and backfill compaction.

Sub-grade preparation for walks, slabs and other facilities.
Fine grading of the work site.
Excavation and backfill for all footings, structures, etc.
Excavation and backfill of all sumps.
Soil compaction as required.
Soil testing as required.
Protective measures.
Dust and noise abatement
Decomposed granite installation.

2.1.3. Protection of Existing Items:

The contractor shall furnish, place and maintain all shoring and bracing as may be required for protection of existing structures and utility services during execution of the work.

2.2.0 MATERIALS

2.2.1. Drain Rock:

Drain rock for all sumps shall be previous backfill as specified in the Standard Specifications, Section 300-3.5.2, Previous Backfill.

2.3.0 EXECUTION

2.3.1. General:

- a. All demolition, clearing and grubbing of objectionable materials must be completed to the satisfaction of the City before starting any earthwork grading and excavation.
- b. Prior to initiating work of this section, the temporary construction fence shall be in place.

2.3.2. Rough Grading:

- a. Rough grading of the site shall be completed in accordance with indicated contours, elevations and limit lines shown on the plans and shall allow for the depths of slabs, paving, play area pea gravel, decomposed granite, sub-base, topsoil and compacted fills. Tolerance for rough grading is one tenth (1/10) of a foot. In all areas, appearance and positive drainage will be factors in the acceptability of grades.
- b. Graded material shall not be left in loose layers, but shall be stockpiled for use as compacted fill or compacted in thin layers as grading takes place in accordance with the requirements for compacted fill.

- c. All surface areas shall be graded so as to provide a minimum 1% surface drainage. The sub-grade surface shall be sacrificed twelve inches (12") deep prior to final grade preparation, and all loose surface rock two inches (2") and larger shall be removed. Dispose of all debris off-site in a legal manner.

2.3.3. Sub-grade Preparation:

Sub-grade for buildings, structures, concrete walks and asphalt paving shall be prepared in accordance with Section 301-1 of The Standard Specifications. Scarify and cultivate the upper twelve inches (12") of sub-grade and compact to as required by the soils report.

2.3.4. Fill and Compaction:

- a. All planting areas to receive fill shall be compacted to 90% except the top twelve inches (12") shall be placed at 85% relative compaction. The topmost twelve inches (12") of fill in all landscape areas shall be topsoil.
- b. Rocks and other debris larger than one inch (1") in diameter shall be removed from all fills to be compacted.
- c. Fill material shall be spread in uniform lifts of six to eight inches (6"-8") of un-compacted thickness.
- d. Prior to starting compaction, the fill material shall be brought to optimum moisture content by spraying with water if too dry, and aeration if too wet.
- e. Thoroughly mix each lift to assure uniform distribution of water content.
- f. Bring fills to suitable elevations above required grades to provide for effects of shrinkage and settlement.
- g. For all areas designated to receive slabs, concrete pavement and decomposed granite pavement and within a perimeter two feet (2') outside these areas, each lift shall be compacted to a minimum of 95% of maximum density as determined by ASTM< D1557-70.
- h. Perform all compaction by suitable mechanical equipment and methods approved by the Soils Engineer.
- i. The contractor shall have tests performed to ensure that all parts of the pavement section, trench backfill, and general earthwork comply with the specifications. These tests will be performed at no cost to the City. Contractor shall pay for any retesting necessary because of failure of the materials or work to comply with the specifications on previous tests. Supply the City with certificate of compaction compliance from licensed engineering testing laboratory.

2.3.5. Excavation:

- a. The contractor shall make all necessary excavation for footings and slabs and do any additional excavation necessary to provide ample room for installation of concrete forms where required.
- b. Footings shall be poured against undisturbed soil subject to the approval of the Soils Engineer.

- c. Bottom of excavations shall be level, free from loose material and brought to the indicated or required grades in undisturbed earth. All excavations shall be kept free from standing water. The Contractor shall do all pumping or draining that may be necessary in carrying on the work. Should excavations for footings, through error, be excavated to a greater depth or size than indicated or required, such additional depth or size shall be filled with concrete at the Contractor's expense.
- d. Excavations for sumps shall be of the size indicated on details and in locations indicated per plan.

2.3.6. Backfilling:

- a. Selected site material shall be used for backfill of trenches and shall be free from large stones and clods. Material shall be as approved by the Soils Engineer.
- b. Backfill shall be deposited in layers of maximum six-inch (6") thickness.
- c. Layers of backfill shall be moistened with water, the amount to be controlled to insure optimum moisture conditions for the type of fill material used. Excess water causing saturated earth beneath footings, walks and curbs is unacceptable.
- d. Backfill shall be compacted by suitable means to a minimum relative compaction of 95%.
- e. Backfill sumps in the manner indicated on drawings and with specified material.
- f. All trenches shall be backfilled in accordance with this section, and may be tested at the discretion of the Engineer.

2.3.7. Fine Grading

Fine grading is to be performed upon completion of all trenching and backfill, and prior to soil preparation. Grades shall slope to drain without water pockets or irregularities and shall conform to the intent of all plans and specifications - after thorough settlement and compaction of the soil. Fine grading should allow for soil preparation work as specified under Section 02800, Planting, such that finish grades shall meet the elevations indicated on the plans. Tolerance for fine grading is one fourth inch (1/4"), plus or minus.

2.3.8. Protection:

- a. It shall be the responsibility of the Contractor to prevent movement and settlement of grades related to, abutting, or adjoining the work site.
- b. Provide necessary temporary lighting, decking, flashers, blockades, planking and the like to maintain safe vehicular and pedestrian traffic adjacent to the work site.

- c. Provide adequate protection to all appurtenances outside contract limits. Any damage occurring from the Contractor's work shall be corrected to the previous condition at the Contractor's expense.

2.3.9. Dust Control:

During all work under this Section, water shall be applied to the surfaces in the work area at frequent intervals and in sufficient quantities to allay the dust as necessary. Alternate dust control methods shall be used only as expressly approved by the City.

2.3.10. Clean-Up:

For the duration of work in this section, debris shall be removed as it accumulates. Accumulation of debris will not be permitted. Removal of debris shall be at the Contractor's expense, off-site and premises, and in a legal manner.

- END OF SECTION -

SECTION 3.0 – CONCRETE

3.1.0 CONCRETE SPECIFICATIONS: GENERAL

3.1.1. Permits

- a. Contractor shall obtain and pay for any permits required.

3.1.2. Intent

- a. The intent of the drawings and specifications is to indicate the process required for the installation without additional cost in labor and material to the Owner.

3.1.3. Scope of Work

- a. Furnish all labor, material, equipment, tools and all necessary operations to perform and complete all construction as indicated in specifications and drawings.

3.1.4. Inspections

- a. A 72-hour notice is required for inspections.
- b. Contractor must be on site for all inspections.
- c. Any non-productive inspection shall be billed to the contractor at the current inspector's rate.

3.1.5. Submittals

- a. All submittals shall be submitted to the City at the pre-job meeting.
- b. Contractor shall submit all, but not limited to, the following items:
 - 1. Manufacturer specifications of material used
 - 2. Manufacturer warranties
 - 3. Required shop drawings
 - 4. Specifications for herbicide
 - 5. Base rock
 - 6. Portland cement
- c. Submittals for substitutions will be considered when specified material is proven unavailable.
- d. All substitutions shall be approved in writing. All substitutions are subject to the review and approval of the City.

3.2.0 CONCRETE SPECIFICATIONS: MATERIALS

3.2.1. Cement

- a. Cement shall be Portland cement standard brand type I or II in compliance with ASTM C-150.

3.2.2. Aggregates

- a. The aggregates shall be in compliance with ATSM C-33. Aggregates shall be class II with a maximum of 3/8" in diameter.

3.2.3. Sand

- a. Sand shall be natural, strong and durable washed, not containing more than 2% of shale, clay or other harmful material, free of impurities.

3.2.4. Water

- a. Water shall be potable free from harmful levels of alkali, acid or salt.

3.2.5. Bars

- a. Bars shall be Grade 40 and in compliance with ASTM A-615.

3.2.6. Welded Wire Mesh

- a. Welded wire mesh shall be 6" x 6" unless otherwise noted. Welded wire mesh shall be in compliance with ASTM A-185.

3.2.7. Tie Wire

- a. Tie wire shall be 16 gauge minimum, black enameled.

3.2.8. Integral Pigment

- a. Integral pigment shall be as specified and mixed and finished as recommended by the manufacturer.

3.2.9. Curing Compound

- a. Curing compound shall be A.C. Horn or equal.

3.2.10 Expansion Joints

- a. Expansion joints shall be asphalt impregnated fiberboard 3/8" thick minimum.

3.3.0 CONCRETE SPECIFICATION: EXECUTION

3.3.1. Sub-grade Preparation

- a. The contractor shall detain a copy of the Geotech survey of the site. Prior to placement of concrete the subgrade shall be compacted using a tamp or roller or as directed by the soils engineer.
- b. Sub-grade shall be compacted to density as stipulated by the soils engineer.

3.3.2. Base

- a. The Base shall have a depth and compaction as specified in details and/or specifications and soils report.
- b. Sand Base shall be mechanically compacted to a smooth surface and completion as specified.

3.3.3. Forms

- a. Forms shall be Douglas Fir or equal with a minimum height of 3½ inches. Forms shall have a smooth texture, straight upper edge.
- b. Bender board or thin planks shall be used for radius curves. Stake curves as needed to hold the radius of the curve.
- c. Forms shall not vary from vertical grade by more than 0.02' in 10' and from horizontal alignment by more than 6". A window of fill dirt may be required to eliminate bulging when concrete is poured.
- d. All forms shall be protected in place for a period of 12 hours minimum prior to pouring concrete.
- e. All forms shall be clean and coated with an approved release agent to prevent the concrete from adhering to forms.
- f. All forms shall be held in place with steel or wood stakes as required.

3.3.4. Reinforcing

- a. Bars
 1. Bars shall be as specified in drawings.
 2. Bars shall be clean and free of rust, oil and grease.
 3. Bars shall be secured together at intersections with 16-gauge wire.
 4. Intersections shall be supported with pre-cast mortar blocks or other approved spacers.

The bars shall be supported in a manner to support foot traffic and concrete pouring without displacement.
 5. All bar welding shall be performed by a qualified welder in compliance with the American Welding Society's recommendations for welding reinforcing steel. (AWS D 12.1) latest edition.
 6. Existing reinforcing bars, which are connected to new reinforcing bars, shall be cleaned to remove any dirt, rust, oil or grease.
 7. Welded wire mesh shall be as specified and is overlapped one full mesh square and shall be held in the middle of the slab.

3.3.5. Concrete Mixing

- a. Concrete mixing shall be in compliance with ASTM C-94 and shall consist of the following:
 1. 6 sacks of Portland cement per cubic yard.
 2. 6-3/4 gallons of water per sack of cement maximum.
 3. Slump, 2 to 5 inches of concrete shall fall in globs from chute. Any soupy mixtures shall not be accepted.
 4. Mixing strength for footings, curbs and flat work shall be 2,800 pounds per square inch @ 28 days.
 5. Concrete mixed in a transit mixer shall be mixed for a period of 10 minutes minimum at a peripheral drum speed of 200 feet per minute.
 6. Concrete color shall be standard gray unless otherwise specified.

7. Integral color ad mixes may be used. Add mixes shall be Davis or L.M. Schofield. Color mixes shall be approved by the City. The contractor / builder shall submit samples for review.

3.3.6. Site Conditions

- a. All existing trees, shrubs, groundcovers, hardscaping and structures within the limits of work specified shall be protected. The contractor shall minimize disturbance to existing root systems of existing trees. The contractor shall not place materials or park equipment under canopies of existing trees.

3.3.7. Weather Conditions

- a. No concrete shall be poured or finished when rain is apparent.
- b. No concrete paving shall commence during rainfall or unless air temperature is 40° F . The contractor shall submit a program for cold weather and hot weather pouring. Report shall be based on ACI Standards.
- c. No concrete shall be mixed or poured when the temperature is below 40°F or when conditions indicate that the temperature will fall below 40° F. Concrete when deposited shall have a temperature of not less than 60° F. Reinforcements, forms, and ground of which concrete will come in contact with shall be completely free of frost.

3.3.8. Pouring

- a. Prior to placement of concrete, all tools and equipment used for mixing and conveying shall be cleaned. All forms must be wet and entire area where concrete will be place must be cleaned.
- b. Concrete pouring shall be carried on, as a continuous operation until the areas of approved size is complete. Cut off locations shall be approved and shall never end on a driveway.
- c. Concrete shall be handled as rapidly as practicable from the mixer to the place of final deposit by methods which prevent the separation or loss of material. It shall be deposited as nearly as practicable, in its final position to avoid re-handling or flowing. Concrete shall not be dropped freely more than six feet. Concrete that has partially hardened shall not be deposited in the work. The discharge of concrete shall be started not more than 45 minutes after the introduction of mixing water. Placing of concrete shall be completed within 90 minutes of the first introduction of water into the mix. It shall not be reworked.
- d. When pouring columns, walls or thin sections of considerable heights, openings in the forms, approved devices shall be used which will permit the concrete to be placed without segregation and the accumulation of hardened concrete on the forms or metal reinforcement above the level of the concrete. Such devices shall be installed so the concrete will be dropped vertically. At least two hours must elapse after depositing

- concrete in walls or columns before depositing concrete in heads over openings, supported beams, girders or slabs.
- e. All concrete shall be thoroughly compacted using approved mechanical vibrators. Internal vibration must be by direct action in the concrete and not against forms or reinforcement. Each pour shall be vibrated until the water shows indications of rising, but not until the water has risen.
 - f. Along the faces of the forms, suitable tools shall be used during the pour to force large particles away from the forms and bring mortar to the surface of the forms. In addition, when approved by the owner's representative, external form vibration may be used. The responsibility for providing fully filled out, smooth, clean and properly aligned surfaces free from objectionable pockets and blemishes shall rest entirely upon the contractor.
 - g. Slabs shall be tamped to depress the rock and push floated with a fill float as necessary. Care shall be taken at all times so that the wet slab meets the screeds accurately.
 - h. When the slab is indicated as being poured directly on an earth construction pad without rock fill, proceed as follows: Although the construction pad was made level within 1.10 feet, it is assumed that by the time all the excavation for footings and utility trenches is completed, the surface will be considerably disturbed. Therefore, it shall be bladed off and brought to an accurate level of slight scarifying if necessary and compacted to a smooth, true surface. This level shall be thoroughly re-leveled before each day's pour and thoroughly wet down, but not flooded.
 - i. Cast in place concrete foundation piers shall be poured into undisturbed pier holds. Casing should be placed where walls of the pier holes show instability. Casing should be withdrawn gradually as pour proceeds. Where ground water occurs in the pier hole, it should be pumped dry before pour or concrete by tremie method.

3.3.9. Construction Joints

- a. Location and details of construction joints shall be as indicated. Joints shall be made and located as not to impair strength of the structure. Review all locations of construction joints with the Owner's representative before blocking out the pours.
- b. Large slabs poured on grade shall be limited to 10 x 10 ft. area between construction joints, or as shown on the details and as approved by the Owner's representative. Pathways shall have control joints every 5 feet. In general, lines of joints shall follow column lines or permanent walls. Construction and control joints shall be tooled with a ½" radius edge tool on both sides of the joint. Make joints straight, true and level. Control joints in 4" thick concrete shall be 1/2" wide by 1" deep minimum; for 6" thick concrete control joints shall be ½" wide and 1 ½" deep minimum. Control joints shall be tooled, saw cutting is not acceptable.

3.3.10. Finishing

- a. Finish shall be as specified on the details or drawings.

- b. After concrete has been troweled to a smooth finish following lines and grades shown on the drawings, one of the following finishes shall be executed:
 - 1. Broom Finishing: Draw broom across the surface at 90° to direction of traffic in a continuous motion from score mark to score mark or edge to edge. The degree of texture will be specified on the drawings. Broom marks shall be neat, parallel and uniform in texture throughout.
 - 2. Washed aggregate finish: Evenly expose aggregate by water washing and brushing or other approved means to an average depth of 1/8 inch. Washed aggregate finish shall be uniform throughout.
 - 3. Avoid pocketing and kicking out of aggregate.
 - 4. Finish shall be uniform throughout in color, texture and degree of exposure of aggregate and shall match existing work.

3.3.11. Protections

- a. Concrete surfaces shall be protected from the elements, defacement and traffic during construction operations with plywood.

3.3.12. Defects

- a. If any concrete work is not formed as indicated, or is under-strength concrete, not level or plumb, or showing objectionable cracks, honeycomb, rock pockets, voids, spalling, exposed reinforcing or damaged vandalism, it shall be repaired or removed and replaced as directed by the Owner's representative and/or City. All cleaning, patching and repairs shall be subject to the Owner's representative's approval and acceptance.
- b. Where defects occur, that section of concrete shall be removed by saw cutting and removed. The defective concrete shall be replaced. The contractor shall core and dowel as required.

- END OF SECTION -

SECTION 4.0 – WALLS & FENCES

MASONRY WALLS

4.1.0 GENERAL

4.1.1. Scope:

Work of this Section includes all material, equipment, and labor incidental to completing all Concrete Unit Masonry work complete as indicated on the Drawings and designated herein, including but not limited to, the following:

Concrete unit masonry.
Grouting of masonry.
Installing reinforcing steel in masonry.
Mortar.

4.1.2. Standards:

Materials and workmanship shall conform to the requirements of all applicable building codes, except that requirements specified herein shall govern where they exceed those in the Building Code. Refer and comply with the provisions of the following Standards, except as otherwise shown or specified:

- a. "Concrete Block Masonry Inspectors' Manual" published by the Technical Committee of California Concrete Masonry Manufacturers Association.

4.1.3. Quality Assurance:

- a. The Contractor shall maintain, continuously, one skilled journeyman mason, who shall be present at all times during execution of this portion of the work and who shall direct all work performed under this Section.
- b. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specific requirements and the methods needed for proper performance of the work of this Section.
- c. Contractor shall verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Report to the Landscape Architect all conditions which prevent proper execution of this work.

4.1.4. Product Handling:

- a. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the work and materials of all other trades.
- b. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Park and Recreation Department and at no additional cost to the City.

4.2.0. MATERIALS

All products shall conform with Section 202 of the "Standard Specifications" except as modified herein.

4.2.1. Concrete Blocks:

- a. All units shall be sound and free of cracks, chips, or other defects.
- b. Sizes and shapes of the units shall be as required to construct the work as shown on the Drawings, using open-end units with closed-end units for openings and corners. Where slopes are required or indicated, they shall be cut from full-sized standard units at the site.
- c. Concrete block shall be readily identified as to origin. All block used for the entire work shall be obtained from a single source and shall be manufactured in one run to insure uniformity of color.
- d. Type and color shall be as noted on the Drawings.
- e. Water Content:
 - (1) At the time of the delivery to the jobsite, concrete masonry units shall have a value, in weight of contained water, of not more than 35% of the fully saturated content for the unit tested.
 - (2) Ship all units from the factory and store at the job site with all necessary protection to prevent increase of water content from rain and other sources.
 - (3) Certification required by Paragraph 1.06-B above shall show results of tests made not more than twelve (12) months prior to delivery of concrete masonry units to the job site, shall show compliance with the specified values, and shall certify that the mix design, yield per batch, and curing procedures for the units delivered to the job site will be equal to those submitted for the test.

4.2.2. Mortar:

All mortar shall be Class D conforming to Section 202-2.1.2 of the "Standard Specifications," color to match block color. Mortar shall contain a waterproofing admixture.

4.2.3. Grout:

Provide transit-mixed grout complying with ASTM C94, and conforming to Section 202-2.1.2 of the "Standard Specifications," and consisting of one part Portland Cement, two and one-half (2-1/2) parts sand, two (2) parts pea gravel and adequate water to produce a concrete of approximately ten inches (10") slump. Grout shall contain a waterproofing admixture.

4.2.4. Water Proofing Admixture:

For all walls exposed to weather provide Sika Red Label, or City approved equal, in all grout and mortar. Follow Manufacturer's recommendations for application rate in grout. Apply at a rate of one (1) pint per 100 pounds of cement in all mortar.

4.2.5. Reinforcement Steel:

Provide reinforcement steel as indicated on the Drawings and in conformance with the requirements of the "Uniform Building Code," latest edition.

4.2.6. Forms:

All forms and shoring shall be thoroughly braced and sufficiently strong to safely carry, without deflection, all dead loads and live loads to which they may be subjected. Shoring shall be in place not less than ten (10) days. Wide grout joints in pier of jambs shall be formed with wood wherever necessary to hold the grout.

4.2.7. Other Materials:

All other materials not specifically described but required for a complete and proper installation of the work of this Section shall be as selected by the Contractor and subject to the recommended approval of the Landscape Architect and City.

4.3.0 EXECUTION

All work shall conform with Section 303 of the "Standard Specifications" except as modified herein.

4.3.1. General:

Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

4.3.2. Mixing Mortar:

Use a mechanical mixer of one sack minimum capacity. Mix mortar for at least three (3) minutes after all materials have been added. Mix only as much mortar as can be used in one (1) hour after water has been first mixed into the batch, Do not re-temper mortar. Use calibrate measuring box, shovel measurements will not be allowed.

4.3.3. Installation:

- a. General: Lay up all walls in running bond, plumb level and true to the lines and dimensions shown on the Drawings, with minimal cutting of block units or use of odd joint sizes or bond. Do not use chipped or broken units. If any such units are discovered in the finished wall, the Landscape Architect or City may require their removal and replacement with new units at no additional cost to the City. Contractor shall core all plumbing, breaking of masonry unit will not be allowed.

- b. Dampening:
 - (1) Store all masonry units on the job so that they are kept off the ground and are protected from the rain.
 - (2) Wetting the units will not be permitted, except when hot and dry weather exists causing the units to be warm to the touch and then only the surface may be wetted with a light fog spray.

- c. Laying Up:
 - (1) Place all units in mortar with full shoved bed and head joints.
 - (2) Align with vertical cells to maintain a clear, unobstructed system of flues.

 - (3) Hold racking to an absolute minimum.
 - (4) Provide clean-outs at the bottom of each cell for removing mortar dropping. Do not close the clean-outs until they have been inspected and recommended for approval by the City.
 - (5) Coordinate with other trades to insure proper installation of inserts into wall (e.g., flanges for wrought iron fencing, posts for chain link fencing, etc.)

- d. Reinforcements:
 - (1) Install all reinforcement as indicated on the Drawings. Fully embedded reinforcement in grout, not in mortar or mortar joints. Provide all required metal accessories to ensure accurate alignment of steel during grout filling operations.
 - (2) The dowels shall be placed in the center of the masonry wall unless otherwise detailed. Dowels shall be placed so that they align with the vertical wall steel.
 - (3) All steel reinforcing shall be lap or weld spliced. Provide a minimum forty (40) diameter lap splice.

- e. Tooling:

Tool all joints to a dense, smooth, flush surface.

f. Grouting:

- (1) Timing: Do not grout until masonry has cured at least twenty-four (24) hours.
- (2) Fill all block cells solid with grout.

4.3.4. Tests:

- a. All tests shall be made by an independent laboratory, as selected by the City. At the beginning of all masonry work, at least one test sample of mortar and grout shall be taken on three (3) successive working days.
- b. Mortar samples shall be taken from the surface soon after spreading. Test cylinders shall be two inches (2") in diameter and four inches (4") high. When tested at twenty-eight (28) days the compressive strength shall not be less than 1800 pounds per square inch.
- c. Grout specimens shall be cast in block cell using masonry units taken from the site. Grout shall be poured into the sample units and puddled, as nearly as possible, in the same manner as that being poured into the wall. Specimens shall remain in the block for three (3) days. Line block with a thin paper towel to permit removal of the specimen without damage. This specimen shall be tested for compression at twenty-eight (28) days and shall develop a minimum ultimate compressive strength of 2000 pounds per square inch.
- d. Concrete Block shall be tested in accordance with "Standard Methods of Sampling and Testing Concrete Units." ASTM Des. C-140. The average compressive strength shall not be less than 1000 pounds per square inch on the gross area.

4.3.5. Clean-Up:

Contractor shall leave exposed surfaces clean and free of surplus mortar or foreign material. Exercise care to keep grout and mortar droppings off finished surfaces.

WOOD FENCES

4.4.0 GENERAL

4.4.1. Scope:

Work of this Section includes all material, equipment, and labor incidental to completing all fence work as indicated on the Drawings and designated herein, including but not limited to, the following:

Fence fabric, posts, rails, braces, and other appurtenances.
Backstop fabrication.

Excavation for foundations.
Concrete foundations for post and cane bolts.
Gates and related hardware.

4.4.2. Standards:

Materials and workmanship shall conform to the requirements of all applicable building codes, except that requirements specified herein shall govern where they exceed those in the Building Code.

4.4.3. Quality Assurance:

- a. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specific requirements and the methods needed for proper performance of the work of this section.
- b. Contractor shall verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Report to the Landscape Architect all conditions which prevent proper execution of this work.

4.5.0 MATERIALS

4.5.1. Components:

- a. Posts: All tubular members shall comply with provision of ASTM -A120 for weight and coating. All structural shapes shall comply with provisions of ASTM - A123 for galvanized coating. Fencing less than six feet (6') in height, 2.375 inch O.D., 3.65 lbs/ft. roll formed sections. Posts shall be placed no further than 8' oc.
- b. Rails: 2 x 6 Redwood.
- c. Pickets: Redwood or cedar 1 x 4 or 1 x 6.
- d. Cap: 2 x 6 Redwood
- e. Screws and Nails: Galvanized
- f. Gate Hardware:
 1. Hinges: Pressed steel of malleable iron to suit gate size, non-lift off type, offset to permit 180 degree gate opening.
 2. Latch: Fork type with integral padlock eye heavy duty malleable iron.
 3. Cane Bolt: 2-piece spring loaded drop bolt with sleeved concrete gate center rest.

4.6.0 EXECUTION

4.6.1. Installation:

- a. Gates shall be full height of fence unless otherwise shown on the plans. Fence shall be six feet (6'-0") high unless otherwise shown on the plans.

- b. Install posts plumb, set in concrete footings.
- c. Connect rails to posts to form continuous bracing from end to end of each run of fence.
- d. Fasten pickets to rails, using galvanized screws.
- e. Install gates to match fence. Install three (3) hinges per gate, and one latch per gate. Provide diagonal braces on all gates.
- f. Provide cane bolt with sleeved socket and concrete center rest at center of all double gate openings.
- g. Wood shall have 1" clearance from soil or concrete.

4.6.2. Clean-up

Upon completion of work of this section, the Contractor shall remove all equipment, excess material, and waste products from the site.

- END OF SECTION -

SECTION 5.0 – SPORTS FIELD SURFACES

5.1.0 GENERAL

5.1.1. Related Documents:

The provisions of the "Standard Specifications for Public Works Construction," latest edition, shall apply except as modified herein.

5.1.2. Scope of Work:

Work of this Section includes all material, equipment, and labor necessary for and incidental to completing all Infield Preparation work, as indicated on the Drawings and designated herein, including, but not limited to, the following:

Sub-grade Preparation.
Furnishing and installing, brick dust, clay.

5.1.3. Submittals:

Submit ten pound (10 lb.) sample of infield material to Landscape Architect for approval prior to ordering delivery. Attach supplier's certification of testing.

5.1.4. Approvals:

Sub-grade shall be approved prior to placing infield.

5.2.0 MATERIALS

5.2.1. Infield Mix:

Infield material shall be **Stabilizer Pro-Gold Infield Mix**, at a depth indicated on plans.

Available from:

Gail Materials, Inc.
1256 Magnolia Avenue
Corona, CA 91719
800-442-7625

5.2.2. Sub-Base:

Site Material.

5.3.0 EXECUTION

5.3.1. Sub-grade Preparation:

Rough grade to four inch (4") depth below finish grade. Scarify to six inch (6") depth and compact to 95% relative compaction. Sub-grade shall be smooth and shall follow the drainage plans as shown on the drawings.

5.3.2. Pre-Emergent Weed Control:

Apply non-selective pre-emergent herbicide to sub-grade, adhering strictly to manufacturer's printed instructions. Application shall be made by licensed Pest Control Applicator. See Section 02800 - Landscape Planting for more information on Weed Abatement.

5.3.3. Topping Course:

Scarify sub-grade to one inch (1") depth. Thoroughly moisten surface without flooding.

Spread topping material in two (2) – two inch (2") layers. Level the toppings courses to smooth plane surface. Thoroughly dampen and compact with minimum three-ton roller. Scarify, re-grade, and re-compact areas not conforming to finish grades as shown on the drawings.

Areas adjacent to all bases shall have infield mix placed not less than six inches (6") thick, as measured after compaction, as shown on plans and details.

- END OF SECTION -

SECTION 6.0 – RESTROOMS & PARK STRUCTURES

RESTROOMS / STRUCTURE SPECIFICATIONS

6.1.0 GENERAL

6.1.1. Permits

- a. Contractor shall obtain and pay for any permits required.

6.1.2. Intent

- a. The intent of the drawings and specifications is to indicate the process required for the installation of Restrooms or Park Structures without additional cost in labor and material to the Owner.
- b. The drawings and specifications shall include all structural calculations necessary and other needed engineering reports.

6.1.3. Scope of Work

- a. Furnish all labor, material, equipment, tools and all necessary operations to perform and complete all construction as indicated in specifications and drawings.
- b. Coordinate work with all other trades.

6.1.4. Inspections

- a. It is the contractor's responsibility to coordinate all inspections. A 72-hour notice is required by the City prior to inspections.
- b. Contractor or his representative must be on site for all inspections.
- c. Any non-productive inspection shall be billed to the contractor at the current inspector's rate.

6.1.5. Submittals

- a. All submittals shall be submitted at the pre-job meeting. The contractor shall submit to the City Landscape Architect three sets of submittals.
- b. Contractor shall submit all, but not limited to, the following items:
 1. Manufacturer specifications of material used.
 2. All manufacturers' product cut-sheets for all materials and/or products specified.
 3. Required shop drawings.
 4. Submittals for substitutions will be considered when specified material is proven unavailable.

5. All substitutions shall be approved in writing.

The City Landscape Architect reserves the right to reject all submittals deemed not in compliance with City standards.

6.1.6. Turnover Items

- a. Contractor must provide electrical, sewer and water as-builts.
- b. Building pad compaction certification.
- c. Building certification of completion.
- d. Domestic backflow device certification or structure.
- e. Restroom/maintenance building plans must be submitted to City of San Jacinto to be reviewed for layout, material, appearance and required amenities only.
- f. Plans must be approved by all applicable City departments prior to issuance of permits.

6.1.7. General Requirements

- a. Provide approved architectural plans for restroom building and other park buildings or structures prior to commencement of construction plans and prior to submittal to the City of San Jacinto Planning Department.
- b. All restrooms must also have a maintenance room to house irrigation controllers, electrical timers and misc. park equipment. The contractor shall provide a utilities schematic of the mechanical room which includes the placement of irrigation controllers. The size of the restrooms and maintenance room will be determined by project size and amenities.
- c. Provide note on drawings to read, "Restroom buildings must be inspected throughout construction by City of San Jacinto".
- d. All restroom buildings must be compliant with ADA regulations.
- e. Provide A.D.A.A.G. note on title sheet of drawings.
- f. Exterior colors must correspond with adjacent community color scheme or the master color scheme.
- g. Provide exterior drinking fountains for all restroom buildings. Specify model #1025 Green by Haws Corporation. www.hawscorporation.com.

6.2.0 MATERIALS

6.2.1. Foundations

- a. Foundations and footings must be per designed and constructed Engineer's drawings and structural calculations as based on soil test and governing codes.

6.2.2. Walls

- a. All restroom walls must be block construction. Block type and color shall be of the style and color as approved by the City.
- b. An approved non-sacrificial, anti-graffiti coating shall be applied to all block walls inside and out.

6.2.3. Doors

- a. Doors shall be commercial steel doors with steel frames.
- b. Specify for all entry doors to swing inward.
- c. Provide electronic battery operated door locks model # CM51961BO-06-KD-626-RH-HSS for restrooms only. Contact Jody Culver @ McAloney Enterprises Inc. (626) 303-3835.

6.2.4. Roofing

- a. Roofing shall be standing seam metal roofing.
- b. Fascia shall be metal, all decorative and/or gingerbread items shall be metal.
- c. Color must correspond with adjacent community color scheme or master color schedule.

6.2.5. Posts and Columns

- a. Posts for park free standing structures shall be 18" square split face block masonry columns or masonry columns faces with a stone veneer.

6.2.6. Beams

- a. Beams and joists for picnic structures shall be steel construction.

6.2.7. Flooring

- a. All restroom/maintenance floors shall be an approved sealed concrete with broom finish.
- b. All restroom/maintenance rooms shall have a 12" dia. floor drain with brass grate.
- c. All floor drains must be positioned in center of room. The floor shall pitch to the drain.

6.2.8. Vents

- a. Provide gable vents as applicable.
- b. Gable vents must match exterior colors.

6.2.9. Lighting

- a. Exterior lights must be controlled by a photocell.
- b. A timer must control interior lights.
- c. Parking lot light standards to be reviewed for layout only.
- d. City of San Jacinto Planning and Building Department must approve plans prior to construction. All other required agencies must approve plans prior to start of construction.
- e. Contractor must submit all manufacturers' product cut-sheets for all material specified for City review.

- END OF SECTION -

SECTION SEVEN – CHILDRENS PLAY AREAS DESIGN & EQUIPMENT

7.1.1. Scope

- a. Furnish labor, material and equipment necessary for the installation of the playground equipment, structure or modular unit as shown on the drawings and specified herein.
- b. Work shall include, but not limited to the following: excavation; layout; and the installing of playground equipment in accordance with the manufacturer's installation specifications, including all appurtenances and accessories as required for a full and complete installation.

7.2.1. Playground Design

- a. An IPEMA certified playground layout plan shall be provided to the City for review. The playground layout plan shall be prepared at a scale of 1" = 10.0'. The playground play shall clearly identify play element placement. A list of the play components shall be provided on the plan. The plan shall also identify the playground color scheme.
- b. The playground design shall incorporate play structures with age appropriate activities as defined by Part 3.
- c. Two seating or picnic tables or combination of seating and picnic tables shall be provided adjacent to the play area. Trees shall be placed in a manner adjacent to the playground play area and seating / picnic area as to provide shade. Tree planters shall be placed at the perimeter of the play area. Perimeter planters shall not intrude into the fall zone safety zone of play equipment. Play structures shall have roof structures to help with playground shading. Play equipment shall be oriented in a way to maximize shading of slides.

7.3.1. Products

- a. Though Miracle Recreation is a City preferred equipment provider; an alternate manufacturer's equipment may be submitted. All play substitutions are subject to City approval.

7.4.1. Playground Safety Standards and Quality Assurance

- a. All public playground equipment supplied shall meet all applicable provisions of the current California Code of Regulations Title 22, Div. 4, Chapter 22. All productions shall bear the certifications seal of the International Playground Equipment Manufacturers Association (IPEMA). All designs shall meet or exceed the Americans with Disabilities Act (ADA) "Final Accessibility Guidelines for Play Areas" regulations as published on October 18, 2000. All manufacturers must be ISO 9001 certified.

7.5.1. References and Standards

- a. California Title 22, Division 4, Chapter 22 Playground Safety Regulations
- b. CPSC: Consumer Product Safety Commission
- c. IPEMA: International Playground Equipment Manufacturers Associations
- d. ADA: Americans with Disabilities Act
- e. ISO: International Organization for Standardization

7.6.1. Warranty/Guaranty

- a. The Contractor shall guarantee installation workmanship for a period of one year from the date of project acceptance. The Contractor shall be responsible for coordinating manufacturer material warranty items with the manufacturer/distributor and for the installation of replacement material(s) at no additional cost to the Owner.
- b. Provide copy of contractor's installation warranty on company letterhead.

7.7.1. Playground Fall Surfaces:

- a. An engineered wood fiber fall surface shall be provided within the play area. The installed surface shall be a minimum of 12" thick. At the time the playground design is submitted, samples of the proposed fall surface shall be submitted.
- b. The grade of the base finish surface shall be prepared to provide positive drainage to area drains within the playground. Playground drains shall be provided; provide a minimum of three drains per playground or one drain per 500 sf when the play area is larger than 1,500 sf.
- c. An approved soil separator fabric shall be placed over the base finish grade prior to the installation of the engineered wood fiber. The soil separator fabric shall be a City approved engineered fabric.

- d. ADA accessibility shall be provided to play areas at two locations. Accessibility can be achieved by the installation of compliant fall surfacing or ramps.
- e. Whenever possible playground drains shall be connected to the storm drain system. When drains are in a playground in a basin, sufficient subsurface drainage shall be provided. If determined necessary by the City a pump shall be installed.

7.8.1. Installation

- a. Instructions: Explicit installation instructions shall be provided by the manufacturer, which shall include detailed, scaled plan view; elevations; footing drawings and details; as well as, written instructions to assure proper installation of the playground equipment, structure or modular unit.
- b. Playground equipment must be installed by a manufacturer certified installer and be installed in accordance with the manufacturer's installation specifications. Installation crew leader must be CPSI certified. If not installed by a manufacturer certified installer the play equipment shall be inspected after installation by a CPSI not employed by the installer and signed off by said CPSI before the playground is opened for first use.
- c. Close Out: Contractor shall provide the Owner with one copy of complete manufacturers installation instructions and maintenance kit if provided. Most manufacturers send at least two sets of installation manuals with each order. Additional sets of installation instructions should be purchased from the manufacturer if originals are lost or damaged. It is the contractor's responsibility to secure the installation instructions from the installer. Miracle Recreation mails one complete set of installation instructions/directions directly to the Owner and the contractor shall not be required to supply additional sets to the Owner.
- d. Clean-up: The site shall be kept clean and free of tools, trash, debris and installation materials on a daily basis. Material may be stored on site during installation with appropriate protective measures and approval by the Owner's representative.

-END OF SECTION -

SECTION EIGHT - IRRIGATION SPECIFICATIONS

8.1.1. Scope of Work

- a. The intent of the drawings and specifications is to indicate the processes required for the installation of a complete operating irrigation system without additional cost in labor and material to the Owner.

- b. The work consists of furnishing all tools, equipment, material, labor and any processes required to provide a complete operating irrigation system as specified in the drawings and specifications.
- c. Drawings are diagrammatic and must be field verified. Contractor must notify Engineer and/or City of San Jacinto immediately of any discrepancies prior to starting work.
- d. Due to the scale of the drawings it is not possible to show all offsets, assemblies, fittings, etc. for a complete irrigation system.
- e. Under this section the contractor shall provide all necessary assemblies, fittings, etc. to provide a complete fully automatic irrigation system as listed in drawings and specifications with no additional cost to the Owner.
- f. Any extra work performed shall be approved in writing by the Owner or Owner's representative prior to the start of such work.
- g. Any unapproved work may be at the contractor's expense.
- h. If reclaimed water is used, contractor shall provide all necessary reclaimed water signage, marking, warning tape and equipment. The entire irrigation system must be in accordance to the local reclaimed water specifications and as listed in drawings. The project Landscape Architect shall reference EMWD standards for reclaimed irrigation water.

8.1.2. Record Drawings

- a. Record accurately on one set of black and white prints denoting variation in work from original drawings.
- b. Dimension from two permanent points of reference (sidewalks, pavement, curbs, street lights, buildings). Record on as-builts daily or as work is performed. All drafting must be clearly legible and dimensions shall be no smaller than 1/4" in size.
- c. Show dimensions from the following locations and depths:
 - 1. Point of connection (P.O.C.)
 - 2. Backflow prevention assembly, master valve and flow sensor.
 - 3. Routing of irrigation pressure mainlines and all directional changes.
 - 4. Ball and butterfly isolation valves.
 - 5. Irrigation control valves.
 - 6. Automatic controller, rain sensors and electrical conduits.
 - 7. Sleeves and pull boxes.
 - 8. Other related equipment (as directed by the Engineer).
- d. Upon completion and approval of record drawing prints, transfer all information to reproducible mylar drawings and provide two additional blue line copies.
- e. Maintain as-built drawings on site at all times. These drawings are subject to inspection at any time.
- f. Make changes to reproducible drawings in ink (no ball-point pen). Erase or use eradicating fluid when revising drawings. Make changes in a manner equal to the original drawings.

- g. Contractor must submit as-built drawings (sepia mylars and two sets of blue lines) to the Engineer inspecting the site seven (7) days prior to the start of the maintenance period for approval.

8.1.3. Controller Charts

- a. As-built drawings shall be approved in writing prior to preparing charts.
- b. Provide two controller charts for each controller supplied, showing the area covered by the automatic controller.
- c. The chart shall be a reduced reproduction of the as-built system. If the controller sequence is not legible when reduced, enlarge it to a size that will be legible when reduced.
- d. Charts shall be black line print with a different transparent color used to show area of coverage for each station.
- e. Completed and approved charts must be laminated with plastic 10 mil thick minimum.
- f. Charts shall be completed and approved prior to final inspection of the irrigation system.
- g. Controller access. The Engineer reserves the right to have complete access to the controller clocks for monitoring and controlling system failures. The contractor shall provide the Engineer with two sets of all keys necessary for access to the controller clocks within the designated area. The keys will then become the property of the Owner.

8.1.4. Operation and Maintenance Manuals

- a. Prepare and deliver to the Engineer, prior to the start of maintenance, all required and necessary descriptive material in complete detail and sufficient quantity, properly prepared in four individually bound copies. Describe the material installed in sufficient detail to permit qualified operating personnel to understand, operate and maintain all equipment. Each manual shall include the following:
 - 1. Index sheet, stating contractor's address and telephone number.
 - 2. Duration of guarantee period with guarantee forms.
 - 3. List of equipment with names and addresses of manufacturer's local representatives.
 - 4. Complete operating and maintenance instructions on all major equipment.
- b. In addition to the maintenance manuals, provide the maintenance personnel with the instructions for major equipment and show written evidence to the Engineer at the conclusion of the work that this service has been completed.

8.1.5. Spare Parts and Equipment

- a. Prior to the start of maintenance prepare and deliver to the Engineer, all required spare parts, tools and equipment. Spare parts, tools and equipment shall include but are not limited to the following:
 - 1. Two quick coupler keys with 3/4 inch bronze hose bib with hand wheel.
 - 2. Two quick coupler lid keys.
 - 3. One valve box cover wrench or key.
 - 4. Two wrenches and shrew drivers for adjustment and disassembly for each type of sprinkler head used in the irrigation system.
 - 5. One 5-foot tee wrench for operating isolation valves specified.
 - 6. Six extra sprinkler heads of each type and size used in the irrigation system.
 - 7. Remote radio device for irrigation controller(s) if specified.

8.1.6. Guarantee

- a. Provide written guarantee in form approved that all work with defects in workmanship and materials will be repaired or replaced at no cost to the Owner for a period of one year from the date of acceptance by the Owner's representative.
- b. This form shall be transferred onto the contractor's letterhead and must contain the following:

Name of Project

We hereby guarantee that the irrigation system we have furnished and installed for **Name of Project** is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications. We agree to repair or replace any defects in material or workmanship, which may develop during the period of one (1) year from the date of acceptance, and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time after receipt of such written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of such written notice from the Owner, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay for the cost and charges therefore upon demand.

Project Name: _____

Owner: _____

Landscape Architect: _____

Location: _____

Signed: _____ Title: _____

Address: _____

Telephone: (____) _____

Date of Signature: _____

8.1.7. Inspections

- a. Refer to the inspection schedule.
- b. No field inspections will commence unless record drawings are current and available for observation upon request by the Owner's representative.

8.1.8. Irrigation System Testing

- a. Owner's representative must be notified 48 hours prior to any irrigation testing or inspections.
- b. Contractor shall perform a pressure test to all pressure lines in the presence of the Owner's representative.
- c. All pressure lines must be tested under hydrostatic pressure of 130 pounds per square inch (PSI) and be proven watertight.
- d. Pressure lines must maintain pressure for a period of two (2) hours. If pressure drop occurs, contractor shall replace joints and repeat test until no pressure drop is achieved.

8.1.9. Pressure Line Observation

- a. Prior to any backfilling of any trench(s) contractor shall call for field observation for verification of material, depths, clearances and warning tape by the Owner's representative.
- b. Any trenching covered that was not inspected or approved shall be made visible for observation at the cost of the Contractor.

8.1.10. Controller Testing

- a. Prior to final acceptance contractor shall provide certification from manufacturer stating that controller specified on drawings has been installed per manufacturer's specifications.
- b. Contractor shall test in the presence of the Owner's representative that all control wires and extra control wires are functioning properly.
- c. Contractor shall provide sufficient manpower and/or radio device to complete such testing in a timely manner.

8.1.11. Lateral Line Testing

- a. Prior to any backfilling of any trench(s) contractor shall call for field observation for verification of material, depths and clearances by the Owner's representative.
- b. All sprinklers and assemblies shall be made visible for observation for verification that all material has been installed per plans and specifications.
- c. Any trenching covered that was not inspected or approved shall be made visible for observation at the cost of the Contractor.

8.1.12. Coverage Test

- a. Contractor shall perform a coverage test in the presence of the Owner's representative. All irrigation sprinkler systems must providing 100% head to head coverage. Any areas not receiving head to head coverage shall be corrected and retested until determined satisfactory to the City.
- b. Contractor shall provide sufficient manpower and/or radio device to complete such testing in a timely manner.
- c. All heads must be adjusted to prevent overspray to buildings, walks, streets etc. (see adjusting the system section). The contractor shall add heads if necessary to provide head to head coverage as directed by the City.
- d. No planting or hydro-seeding shall take place until coverage test has been approved in writing by the Owner's representative. Tree planting may commence upon approval from Owner's representative.

8.1.13. Final Irrigation Inspection

- a. All irrigation systems shall be tested in the presence of the Owner's representative and by under complete automatic operation and proven to be leak free irrigating designated areas per plans and specification with least amount of over spray as possible.
- b. Contractor shall provide as-built record drawings and controller charts at final irrigation inspection for approval prior to mylar transfer and laminating.
- c. All irrigation turn over items shall be turned in to the Owner's representative prior to the start of maintenance.

8.2.0 MATERIALS

8.2.1. Backflow Prevention Devices

- a. Backflow prevention units shall be approved by the Foundation for Cross-Connection Control and Hydraulic Research.
- b. Backflow assemblies shall be installed using brass ells, unions and nipples.
- c. Type: For 2" or smaller use Febco 825YA or approved equal. For 3" or above use a Febco 825Y model.

- d. Backflow device enclosure shall be constructed of stainless steel #9 expanded metal with an angle iron frame. LeMeur, Strong Box, All Spec or approved equal enclosure shall have a hinge on one end that allows for removal of the enclosure for backflow service. Enclosure shall be bolted to a concrete pad using galvanized steel hardware.

8.2.2. Pressure Reducing Valves

- a. Pressure reducing valves shall be of bronze and stainless steel construction and be adjusted from 25 P.S.I. to 125 P.S.I.

Manufacturers: Wilkens 500HLR or approved equal.

8.2.3. Wye Strainers

- a. Wye strainer shall be Wilkens 100YSBR or approved equal bronze construction with a stainless steel screen element. Wye strainer shall have a standard filtration size of 80 mesh.

8.2.4. Shut off Valves

- a. Ball Valve:

- 1. Shut off valves 2 inches and smaller shall be ball valves.
- 2. Ball valves shall have a one-piece body constructed of 600 lb. WOG Bronze material conforming to ASTM B-584 alloy 844. Ball valves shall have a vented ball with a blowout proof system. Ball valves shall have a working pressure of not less than 150 P.S.I. and shall conform to AWWA standards.

- b. Butterfly Valves:

- 1. Shut off valves 2-1/2 inch and larger shall be butterfly valves.
- 2. Butterfly valves shall have a one-piece body constructed of cast iron and stainless steel stem. Butterfly valves shall be equipped with Vanstone lange adapters and a 2-inch square-operating nut. Butterfly valves shall have a working pressure of not less than 150 P.S.I. and shall conform to AWWA standards. Butterfly valves shall have a ductile iron porcelain enamel coated disc.

8.2.5 Quick Coupler Valves

- a. Quick coupler valves shall have a body constructed of red brass with a wall thickness guaranteed to withstand normal working pressure of 150 P.S.I. without leakage with female threads (penning at base). Quick coupler valve shall have a hinge cover constructed of red brass with leather like vinyl cover bonded to it on such a manner that it becomes permanent type of cover. Quick couplers used with potable water shall have vinyl covers

yellow in color. Quick coupler valves used for reclaimed water shall have vinyl covers purple in color with the appropriate reclaimed water warnings in English and Spanish as well as the international "Do Not Drink" symbol.

- b. All quick coupler valves must have a schedule 80 ball valve to isolate mainline from quick coupler valve. Mainline shall be size of quick coupler valve from mainline tee to quick coupler.

8.2.6. Remote Control Valves

- a. The remote control valve shall be normally closed 24 VAC solenoid actuated globe pattern, spring-loaded diaphragm type. The valve shall be pressure rated up to 200 P.S.I. at 150 degrees F.
- b. The valve shall have a 600-pound test fabric reinforced rubber diaphragm assembly with self-cleaning stainless steel screen.
- c. Remote control valve body and bonnet shall be brass and the valve shall have a stainless steel control/ shut-off stem and manual operator.

8.2.7. Master Control Valves

- a. The master control valve shall be an either normally closed or open 24 VAC solenoid actuated globe pattern, spring loaded diaphragm type. The valve shall have up to 220 P.S.I. at 150 degrees F. pressure rating.
- b. The body bonnet shall be plastic and the valve shall have a stainless steel control shut-off stem and manual operator.
- c. The valve shall have a 600-pound test fabric reinforced rubber diaphragm assembly with self-cleaning stainless steel screen.

8.2.8. Flow Meter

- a. Flow meter shall be constructed of a schedule 80 tee with a solid state o-ring sealed epoxy fused sensor housing and nylon impeller.
- b. Flow meter must be installed and wired per manufacturer's specifications.

8.2.9. Rain Sensor

- a. Rain sensor shall be a heavy-duty plastic container with epoxy sealed electronics installed within a 1/8-inch thick steel enclosure. Mount sensor on controller enclosure or building eave per manufacturer's specifications. Sensor shall be wired per manufacturer's specification.

8.2.10. Basket Strainer

- a. Basket strainer shall be manufactured with a bronze body with an 80-mesh filtration element with a stainless steel basket.

8.2.11. Booster Pump

- a. Booster pump shall be as manufactured by Barrett Engineered Pumps, San Diego, California (619) 232-7867. The engineer shall determine pump.

8.2.12. Filtration Equipment

- a. Filter shall be Turbo-Clean in filter available from Amiad Filtration Systems Inc. (800) 969-4055.
Specify filter at P.O.C. and install per filter detail.

8.2.13. Automatic Controller

- a. The controller shall operate on a minimum of 120 volts A.C. power input and shall be capable of operating up to four 5.5 VAC 24 volt A.C. remote control valves at once. The controller shall have a reset circuit breaker to protect the controller from overloading.
- b. The controller shall have independent programmable stations. The controller-programming schedule shall be capable of allowing four automatic start times per day on four separate programs. Station timing shall be variable from 1 to 99 minutes. The controller must have a water budgeting function to allow increasing or decreasing of watering times for all stations at once.
- c. The controller shall have a master valve/remote pump start circuit for use with a master valve to pressurize the system when the programmed cycle starts to activate a remote pump start relay to run the pump during the programmed cycle.
- d. The controller shall have manual watering capabilities for single station operation at any time without changing programmed times.
- e. The controller shall have a factory installed backup program for standby operation and a backup battery to maintain the programs during power loss.
- f. Install one extra 1-1/2" inch conduit to controller for future use.

8.2.14. Controller Enclosure

- a. All controllers installed outside must be mounted inside a stainless steel enclosure with lockable-hinged doors.
- b. The enclosure shall have one full time 120 VAC GFCI type circuit with on/off switch and pigtail connection for remote control use.

8.2.15. Control Wiring

- a. All control wiring for connections between remote control valves and controller shall be direct burial AWG-F wire installed in accordance with manufacturer's specifications.
- b. All splices shall be sealed with waterproof connectors and waterproof sealant.

- c. Wiring shall be buried adjacent to mainline wherever possible and for more than one wire they shall be bundled at every ten feet using black electrical tape.
- d. Expansion curl shall be provided within three feet of each connection and at all changes in direction. Provide a two-foot expansion loop for every 100 feet of run.
- e. Wire size shall not be smaller in diameter than #14 gauge.
- f. Control wires shall be black in color. If additional controllers are installed provide different color common wires for each controller.
- g. Common wire shall be white in color. If additional controllers are installed provide white wire with colored stripe. Stripe to be same color as control wire color.
- h. Contractor shall provide one extra wire for every five valves and two extra wires shall be provided for every valve in any isolated area and the extra wires shall extend past the last valve in a group. Extra wires shall be orange in color and looped in every valve box and made accessible for future use if needed.
- i. No wire splices shall be permitted unless run is longer than 2500 feet or approved by Owner's representative.

8.2.16. Valve Boxes

- a. Rectangular valve boxes shall be 9-1/2 inches wide by 16 inches long and 11 inches high. Round valve boxes shall be 10-inches in diameter and 10 1/4 inches high. All valve boxes shall be constructed of rigid polyolefin.
- b. Valve boxes shall have locking covers, secure with a 3/8-inch stainless steel bolt and washer.
- c. Rectangle valve boxes shall be used for control valves, master control valves, pressure regulators, flow sensors, wye strainers, basket strainers ball valves, butterfly valves and pull boxes.
- d. Round valve boxes shall be used for quick coupler valves.
- e. All valve boxes to be green in color unless otherwise specified for use of reclaimed water. All valve boxes for reclaimed water shall be purple in color and bare the reclaimed water warnings as well as the international "Do Not Drink" symbol.
- f. Heat brand all box lids with the appropriate two-inch high identification letters and/or numbers.
- g. All valve boxes shall receive landscape fabric. Landscape fabric shall be constructed of 5.0 oz. weight proven polypropylene weed barrier with burst strength of 225 P.S.I. and capable of 12 gallons per minute of water flow and puncture strength of 60 lbs. Dewitt Pro, Mirfy or approved equal.
- h. All valve boxes shall receive 2 cubic feet of 3/4-inch gravel per plan.

8.2.17. General Piping

- a. Pressure line from point of connection to backflow prevention device shall be brass or Type K copper.

- b. Pressure lines 2" and smaller after backflow prevention device shall be Schedule 40 solvent-weld P.V.C.
- c. Pressure lines 2-1/2 inches to 3 inches after backflow prevention device shall be Class 315 solvent-weld P.V.C.
- d. Pressure lines 1-1/2 inches and smaller after backflow prevention device shall be Schedule 40 solvent-weld P.V.C.
- e. Pressure lines 4 inches and larger after backflow device shall be Class 200 bell and gasket P.V.C.
- f. Lateral lines 1-1/2 inches and smaller shall be Schedule 40 solvent-weld P.V.C.
- g. Lateral lines 2 inches and larger shall be Class 315 solvent-weld P.V.C.
- h. All pipe and fittings shall bear the markings of the Manufacturer's name, nominal pipe size, pressure rating P.S.I., NSF, schedule or class and date of extrusion.

8.2.18. Plastic Pipe

- a. Solvent weld pipe shall conform to ASTM D 1784 or D 2241 to meet the requirements of cell classification 12454B for pipe. Pipe shall be extruded of an improved P.V.C. virgin pipe compound high impact strength. Compound shall have a hydrostatic design stress rating of 2,000 P.S.I. Manufacturers: Pacific Plastics or approved equal.
- b. Rubber gasket P.V.C. pipe shall conform to ASTM D-1784 Type I, Grade I 2,000 P.S.I. design stress. All pipes shall conform to commercial standards CS-256-64 and NSF testing laboratories. Rubber gaskets shall conform to ASTM 1869.
- c. Reclaimed water pipe shall conform to ASTM D1784 or D 2241 to meet the requirements of cell classification 12454B for pipe. Pipe shall be extruded of an approved P.V.C. virgin pipe compound high strength. Compound shall have a hydrostatic design street rating of 2,000 P.S.I. Reclaimed water pipe shall be purple in color and bare the words "CAUTION - RECLAIMED WATER" printed in black letters on two sides of all pipes.
- d. Ultra Violet Resistant (U.V.R.) pipe shall conform to ASTM D 1784 or D 2241 to meet the requirements of cell classification 12454B for pipe. Pipe shall be extruded of an approved P.V.C. virgin pipe compound high strength. Compound shall have a hydrostatic design street rating of 2,000 P.S.I. U.V.R. pipe shall be manufactured using material proven to resist corrosion by ultra-violet radiation. Pipe shall be brown in color.

8.2.19. Fittings

- a. All pressure line fittings 3 inches and smaller shall be Schedule 80 solvent weld P.V.C. Fabricated pipe shall be from an NSF approved Type I, Grade I, P.V.C. compound conforming to ASTM D1784.
- b. All pressure line fittings 4 inches and larger shall be iron ductile deep bell type constructed of grade 65-45-12 and shall be in accordance with ASTM A536. Rubber for gaskets in fittings shall be in accordance with ASTM-477.

All iron ductile fittings shall have stainless steel exterior lugs to secure a joint restraint system.

- c. All lateral line fittings downstream from control valves shall be Schedule 40 solvent weld P.V.C. Fabricated pipe shall be from an NSF approved Type I, Grade I, P.V.C. compound to ATTM D1784
- d. Provide primer and solvent cement for PVC solvent weld pipe and fittings of specified type by manufacturer's recommendations.
- e. All fittings shall have the manufacturer's name, trademark and size applicable NSF or IPS approval.
- f. All threaded fittings shall have 3/4 inch teflon tape.

8.2.20. Brass Pipe and Fittings

- a. Brass pipe shall be in accordance with American National Standard Institute and be 85 percent Schedule 40 red brass.
- b. Brass fittings shall be threaded 125-pound class.

8.2.21. Galvanized Steel Pipe and Fittings

- a. Galvanized steel pipe shall be Schedule 40 hot dipped galvanized.
- b. Galvanized fittings shall be Schedule 40 hot dipped galvanized.

8.2.22. Irrigation Heads (General)

- a. All irrigation heads shall be the size, type, and provide the same rate of precipitation with the same radius of spray, pressure and discharge in G.P.M. as listed on drawings.
- b. All spray head sprinklers shall have stainless steel screw adjustment for radius of spray.
- c. Riser and swing joint assemblies shall be as indicated on drawings.
- d. All irrigation heads shall have a factory installed check valve or have an after market check valve installed.
- e. All other requirements for non-pressure lateral line pipe to be as specified in fitting specification section.
- f. In no case shall the irrigation head spacing exceed the maximum manufacturer's recommendation.
- g. Irrigation heads along walks, curbs, paving, etc. shall be positioned 1 inch above finish grade. Irrigation in turf areas shall be positioned 2 inches above finish grade.
- h. All sprinkler heads shall be set perpendicular to finish grades.

8.2.23. Bubblers

- a. Bubblers shall be constructed of heavy duty plastic and be full circle and pressure compensating. The bubbler shall have a screen to protect it from clogging.
- b. Bubblers shall be adjustable from .25 - 1.0 GPM and operate between 20-90 PSI.

8.2.24. Sprinkler Heads

- a. The sprinkler body, nozzle, stem and screen shall be molded out of heavy duty plastic.
- b. Pop-up height shall be as listed in drawings and in no case shorter than 4 inches.
- c. The sprinkler shall have an adjustment screw used for regulating flow and radius with matched precipitation rate (MPR) nozzle.
- d. The sprinkler shall have a removable screen to protect it from clogging.
- e. The sprinkler shall have a stainless steel spring for proper pop down.
- f. The sprinkler shall be equipped with a factory installed check valve (seal-a-matic {SAM}) identified on the cap and capable of holding water up to 10 feet of elevation change.
- g. The sprinkler shall be equipped with a factory installed pressure-regulating device constructed of stainless steel and heavy-duty plastic capable of maintaining a pressure of 35-70 P.S.I. to 30 P.S.I. for operation of the sprinkler.

8.2.25. Rotor Heads (Medium Range)

- a. All pop-up rotors shall have a rubber cover and be constructed of heavy duty plastic except for wiper seal, bearing spring and bearing washers. All rotors to have a reinforced rib design with flange encasement.
- b. Pop-up height shall be as listed in drawings and in no case be shorter than 3-1/2 inches.
- c. The rotor shall have a diffuser pin for regulating flow and radius.
- d. The rotor shall have a screen to protect it from clogging and have a minimum inlet of 3/4 inch.
- e. The rotor shall be capable of covering 16-55 feet radius at 20-60 PSI with a rate of .5 - 9.2 GPM. and be adjustable from 1-360 degrees.

8.2.26. Rotor Heads (Large Range)

- a. All pop-up rotors shall have a rubber cover and be constructed of heavy duty plastic except for wiper seal, bearing spring and bearing washers. The riser shall be constructed of plastic encased in a stainless steel sleeve. All rotors to have a reinforced rib design with flange encasement.
- b. Pop-up height shall be as listed in drawings and in no case be shorted than 3-1/2 inches.
- c. The rotor shall have a diffuser pin for regulating flow and radius.
- d. The rotor shall have a screen to protect it from clogging and have a minimum inlet of 1 inch.
- e. The rotor shall be capable of covering 16-55 feet radius at 40-74 PSI with a rate of 3.8 - 27.5 GPM. and be adjustable from 1-360 degrees.

8.2.27. Trenching and Backfilling

- a. No trenches are to be backfilled until approval from Owner's representative has been acquired.
- b. Excavate trenches straight and support pipe continuously on the bottom of trench per layout indicated on drawings.
- c. All lines shall have a minimum clearance of 4 inches from each other and 24 inches from any other lines from other trades.
- d. Provide the minimum covers as listed below:
 1. Pressure lines 4 inch and larger 30 inches
 2. Pressure lines 3 inch and larger: 24 inches
 3. Pressure lines 2-1/2 inches and smaller: 24 inches
 4. Lateral lines 18 inches
 5. Control wiring 24 inches
- e. Fine granular soil not larger than 1/2 inch shall be used for initial backfill and compacted to a density equal to undisturbed soil. Use clean backfill soil not greater than 1 inch for remaining backfill.
- f. No flooding shall be performed to compact trenches unless approved by the Owner's representative.
- g. Sand backfill to a minimum of 3 inches shall be applied to all piping under paved areas.
- h. If any settlements occur and irrigation adjustments are required the contractor shall make these adjustments with no additional cost to the Owner.
- i. Contractor shall install concrete thrust blocks for all pressure lines 2 inches and larger. Thrust blocks shall be a minimum size of one cubic foot. For bell and gasket pipe a joint restraint system shall be used instead of thrust blocks per manufacturer's specifications.

8.2.28. Flushing the System

- a. Open control valve after all piping and required assemblies have been completed to flush out the system.
- b. Irrigation heads are to be installed after completion of flushing the system satisfactory to the Owner's representative.

8.2.29. Adjusting the System

- a. The contractor shall flush and adjust all irrigation heads, control valves, pressure regulators, etc. for optimum performance.
- b. All heads must be adjusted to prevent overspray to buildings, walks, streets etc.

8.2.30. Sleeving

- a. All sleeving shall be 2 times the diameter of the pipe used. Sleeving for control wires shall be 2 inches in diameter minimum.
- b. All sleeving shall have minimum a cover of 24 inches under paving.
- c. All trenches for sleeving must be compacted to 95% compaction using manual or mechanical taping device.
- d. Contractor shall cap and pressure test all pressure lines under paving prior to backfilling and paving.
- e. Contractor shall be responsible for the installation of all sleeves required for the irrigation system not listed in the drawings.
- f. Extend sleeves 12" beyond the edge of hardscape.

8.2.31. Layout

- a. Contractor shall layout irrigation mainline, valves, and sprinklers etc. for approval from the Owner's representative.

8.2.32. Additional Miscellaneous Items

- a. All pipe above grade are to be stabilized with j-hooks at every 10 feet. J-hooks shall be #4 x 18 inch rebar painted with black epoxy paint prior to installation.
- b. All assemblies requiring rebar stabilizing rods per plan and details shall be with #4 x 30 inch rebar and supported by vandal proof clamps constructed of stainless steel installed with a tool specifically designed for the process.
- c. Contractor shall install metallic warning tape over all pressure supply lines with a cover of 12 inches from grade. Warning tape for potable water shall be blue in color and the words, "CAUTION WATER LINE" permanently attached to tape. Warning tape for reclaimed water shall be lavender in color and the words, "CAUTION RECLAIMED WATER" permanently attached to tape. Warning tape shall be 3" wide minimum.
- d. Contractor shall provide identification tags with the number labeled for each valve attached to each valve. For potable water the tags shall be yellow in color with black lettering. For reclaimed water the tags shall be lavender in color with black lettering.
- e. All utilities, valve boxes, valves, sprinklers, quick couplers, etc. shall either have lavender caps or lavender colored parts as provided by the manufacturer for use a reclaimed water.

8.2.33. Water Supply

- a. The Irrigation system shall be connected to water supply as shown on drawings. Contractor shall notify Architect immediately of any discrepancies.
- b. The Contractor shall be responsible for any minor changes due to actual site conditions.

8.2.34. Electrical Supply

- a. Contractor to coordinate final location of controller with job site Superintendent and Owner's representative.
- b. Prior to installation of controller contractor to verify that all required electrical equipment is accessible for complete installation.
- c. Electrical connections and equipment must be as listed in controller installation section and per manufacturer's specifications.
- d. Contractor shall have irrigation system under complete operation for a period of seven (7) days prior to planting or hydro-seeding.
- e. Contractor shall maintain entire irrigation system to an acceptable condition to the Owner's representative for the period of 90 days unless otherwise noted.

8.2.35. Reclaimed Water

- a. Plans, details and specifications for reclaimed water shall be prepared to comply with water agency and health department standards for reclaimed water.
- b. Reclaimed irrigation lines shall maintain a 10' horizontal separation from potable water lines.
- c. Reclaimed lines which cross potable water lines shall be placed below potable lines minimum of 36". When reclaimed water lines cross below potable water lines, reclaimed water lines shall be placed in a purple schedule 40 pvc pipe sleeve. The sleeve shall extend a minimum of 5' on each side of the potable water line.
- d. All irrigation lines for reclaimed water shall be schedule 40 pvc. All irrigation lines shall be stamped with the appropriate warning labels. Lateral lines shall have a minimum of 18", mainlines shall have a minimum cover of 36". Warning tape shall be placed continuously along the pipe. Warning tape shall be placed 12" above reclaimed irrigation lines.
- e. All valve boxes shall be purple and labeled with proper warning text.
- f. In addition to the required valve tags, valves shall have purple warning tags attached to them.
- g. Reclaimed water warning sign, with text and labels compliant with the health and water agency standards, shall be placed in public use areas. Warning signs shall be placed at all parking areas, where walks enter parks, at picnic plazas adjacent to play grounds.
- h. Irrigation systems must be designed in a manner which prohibits them from over spraying hardscape, playgrounds or any other hard surface activity areas.
- i. All heads and equipment shall be labeled and color coded for reclaimed water use.
- j. Irrigation systems shall be designed and installed to operate from 11 pm to 6 am.
- k. Quick couplers shall not be used for reclaimed water systems.

- l. Reclaimed irrigation systems shall have filtration systems installed.
- m. Reclaimed water shall not be cross connected with potable water.
- n. For public areas, the reclaimed water system must be certified by the City.

- END OF SECTION -

SECTION 9.0 - PLANTING

9.1.0 GENERAL

9.1.1. General Requirements

- a. Permits: Contractor shall obtain and pay for any permits required.
- b. All irrigation shall be completed, tested and approved by the City. Irrigation will only be accepted when it has been installed in compliance with City standards, has passed all tests and is fully under automatic operation.

9.1.2. Scope of Work

- a. The intent of the drawings and specifications is to indicate the processes required for the installation of a complete planting without additional cost in labor and material to the Owner.

9.1.3. Inspections

- a. Request for inspections must have 72 hours notice in advance.
- b. Contractor must be on site for all inspections.
- c. In the event that the contractor has not completed the work to be inspected prior to the scheduled inspection the contractor shall be billed for the inspection at the current inspector's hourly rate. The contractor shall be billed a minimum of one hour.
- d. Any work completed without inspection or approval shall be removed, exposed or replaced at the cost of the contractor.
- e. The contractor shall call for inspections in accordance with the specified inspection schedule of these specifications.

9.1.4. Submittals

- a. All submittals shall be submitted within 15 days after receipt of executed contract.
- b. Contractor shall submit the follow items but not limited to:

1. Plant material proof of purchase with listed nurseries and material sizes for approval
2. All soil amendments
3. Mulch
4. Soils report
5. Labels for all herbicide and fertilizers used
6. Hydro-seed mix

9.2.0 MATERIALS

9.2.1. Plant Material

- a. All plant material shall be the same as specified in the drawings. Plant substitutions shall not occur without the approval of design Landscape Architect and City.
- b. All plant material delivered to the site shall have in place nursery tags with the plant name in accordance with the recommendations of the American Association of Nurserymen.
- c. All plant material shall be free of pests, plant diseases abrasions or any other objectionable disfigurements.
- d. Plant material must show vigorous habit of growth that is normal for that particular species.

9.2.2. Tree Stakes

- a. Tree stakes shall be copper maphthanate, green color impregnated lodge pole pine.
- b. Tree stakes shall be 2" in diameter and 10 feet long.
- c. Tree ties shall be V.I.T. cinch ties or approved equal four per tree typ.
- d. Tree ties shall be attached to lodge poles with galvanized nails per detail.

9.2.3. Vine Ties

- a. Vine ties shall be as specified in details and approved by the City.

9.2.4. Herbicides

- a. Contractor shall submit labels of all herbicides used prior to application for approval.
- b. Contractor shall apply pre-emergent herbicide to all areas possible as recommended by a licensed pest control consultant.

9.2.5. Concrete Mow Curb

- a. Concrete mow curb shall be 6" sq. with 2500 PSI test at 28 days. The contractor shall provide 1" deep x 1/2" wide tooled control joints at 5' oc. Expansion joints shall be installed at 20' oc. Concrete color shall be per plan with a medium broom finish.

9.2.6. Plant Tablets

- a. Planting tablets shall be as specified in detail and approved by the City.

9.2.7. Soil Conditioners

- a. All soil conditioner material shall be approved prior to ordering under this section.
- b. Soil conditioners shall be based on soil report recommendations.

9.3.0. EXECUTION

9.3.1. Installation

- a. Contractor shall clean, remove legally and dispose of all weeds, grasses, including roots and construction debris under this section. Prior to plant installation or seeding the contractor shall complete a weed abatement of the site. The weed abatement program shall be submitted to the City and approved prior to implementation.
- b. Contractor shall be responsible for the protection and storage of all material for the project. The contractor shall not store plant materials on site longer than 48 hours.
- c. All grades shall be as indicated on the drawings and must be +/-10% within specification.

9.3.2. Landscape Grading

- a. The contractor shall complete grading and filling as needed or remove additional dirt, rock and debris over ½" inch in diameter within the top 6 inches in all turf areas. Rocks in planter areas shall not be larger than ¾" in diameter within the top 6" of soil.
- b. Grading shall be completed as to avoid ponding or standing water. All ball or sports fields shall have uniform drainage. Drainage shall uniformly flow to catch basins and drain inlets. Prior to finish grading all grades must be certified by the project Civil Engineer and City Engineer. Grade certification shall be provided in writing to the City prior to the commencement of planting operations.
- c. Ball fields and sports fields shall have a minimum slope of 1% and maximum slope of 1 ½%. All landscape areas shall be sloped to provide positive drainage.

9.3.3. Soil Preparation

- a. Contractor shall rotor-till amendments into all turf and planter areas 3:1 or less throughout the first 6 inches.

- b. The following application rate is for bidding purposes only and is per 1000 square feet of planting area.
 - 1. 4 cubic yards of soil conditioner
 - 2. 30 lbs. of commercial fertilizer approved by the Owner's representative
 - 3. 50 lbs. of agriculture grade gypsum
 - 4. 25 lbs. soil sulfur
- c. Actual soil preparation shall be based on the soils report.
- d. Soil samples shall be taken in the presence of the Owner's representative.
- e. Contractor shall submit soil samples to an approved laboratory testing facility. A copy of the soils report shall be submitted to the City.
- f. Contractor shall provide one soil report for every acre.
- g. Soil recommendations must be separated for turf, planter, slope and plant material backfill mix.

9.3.4. Weed-abatement

- a. Weed-abatement shall not commence until complete irrigation system is under complete automatic irrigation and has been approved.
- b. Upon completion of soil preparation the contractor shall complete the following:
 - 1. Irrigate all area to be planted, sodded or seeded for a period of seven days to germinate all weed seeds.
 - 2. Cut watering and apply approved weed killer per manufacturer's recommendations and allow adequate time to complete kill.
 - 3. Repeat step one and two.
 - 3 Obtain approval of completed weed-abatement prior to any planting. Trees may be planted prior to weed-abatement process with the approval of the Owner's representative in writing.

9.3.5. Layout

- a. Contractor shall layout all tree and shrubs for approval from the Owner's representative prior to excavating any planting pits.
- b. Contractor shall not willfully layout any planting material where obstructions exist. The contractor shall notify the engineer to obtain direction.

9.3.6. Planting

- a. Planting shall be as shown in detail and as follows:
 - 1. Excavate all planting pits to a diameter twice the size of container to be planted and 1 1/2 times the depth of container to be planted.
 - 2. Contractor shall scarify the side of planting pits if an auger is used with shovel or digging bar.

3. Plant material shall be placed in planting pit in a manner as not to disrupt the root ball and the crown shall be set aligned flush to grade.
4. Provide fertilizer tablets per detail.
5. Backfill all plant material with approved backfill mix.
6. Contractor shall provide fertilizer tablets to all rooted cuttings.

9.3.7. Percolation Test

- a. Contractor shall flood planting pits with water to test water penetration through the soil, if no penetration occurs the contractor shall auger 6 inches in diameter and 36 inches long and backfill with pea gravel, repeat water test and if water still does not penetrate the contractor shall notify the Owner's representative prior to planting.

9.3.8. Sodded Turf

- a. All sodded areas shall be semi dwarf fescue unless otherwise noted.
- b. Contractor shall evenly rake all sodded areas to level and remove all rocks 3/4 inch in diameter and larger.
- c. Contractor shall spread commercial fertilizer per the soils report to all sodded areas.
- d. Sod shall be placed within 12 hours of delivery.
- e. Sod must be laid along a straight line staggering each row like laying bricks and must be butted tightly together preventing any air pockets. Do not overlap edges.
- f. Sod shall be cut with a sharp knife and never pulled apart.
- g. Sod shall be rolled immediately after sod is installed.
- h. Sod must be watered thoroughly to a depth of 12 inches.
- i. Contractor shall monitor watering to prevent browning and fungus.
- j. Contractor shall take every measure possible to protect sod by providing temporary fencing if necessary at no additional cost.

9.3.9. Turf Hydro-seeding

- a. Hydro-seed seed mix shall be as indicated on the drawings.
- b. Contractor shall evenly rake all sodded areas to level and remove all rocks 3/4 inch in diameter and larger.
- c. Hydro-mix slurry shall be as follows:

Seed	as specified
Fiber	2,000 lbs. per acre
M-Binder	100 lbs. acre
Water	3,000 gal per acre or as required
Fertilizer/Soil Conditioner	1,100 lbs per acre

- d. Contractor shall monitor watering to prevent browning and fungus.
- e. Contractor shall take every measure possible to protect sod by providing temporary fencing if necessary at no additional cost.

- f. Hydro-mulch slurry shall be applied under high pressure evenly and provide a uniform coat on all areas specified.
- g. Overspray shall be removed immediately from sidewalks, walls or any structures.
- h. Contractor shall provide 98 percent germination to all hydro-seeded areas prior to turn over.

9.3.10. Root Barriers

- a. Lineal root barrier shall be "Deep Root" control barrier panels # UB 24-2 or an approved equal. No cylinder root barriers shall be approved.
- b. Root barriers shall be installed for all trees planted within five (5) feet of any hardscaping. Lineal root barriers shall extend 15' in each direction from the tree trunk. Where trees are planted in parkways, root barriers shall be placed on each side of the tree. For parking islands, plaza tree cut outs, trees at playgrounds or diamond planters, root barriers shall be placed around the entire parameter of the planter.
- c. Contractor shall install root barriers per approved detail.

9.3.11. Jute Netting

- a. Jute netting shall be uniform plain weave, flame-retardant mesh. Geo-jute, smolder resistant or approved equal. The mesh shall be green in color. Install netting on all slopes with a gradient of 2:1 or steeper.
- b. Jute shall be 48 inches wide with a weight of .97 pounds per linear yard.

9.3.12. Guarantee

- a. All plant material shall be guaranteed for a period of one year.
- b. All plant material that is dead or dying or as directed by the engineer within the guarantee period shall be replaced at the cost of the contractor with seven (7) days of written notice.
- c. All replacement plant material shall be exact as specified in species and size. No substitutions shall be allowed unless written approval from the engineer is obtained.

- END OF SECTION -

SECTION TEN – MAINTENANCE

10.0.0 GENERAL

10.1.1. Maintenance Duration

- a. Contractor shall maintain entire project within the contractor's scope of work until final approval for all work has been obtained. Only upon the written approval of the City shall the maintenance period start. The maintenance period shall consist of a sixty day plant establishment period and sixty day maintenance period.
- b. During the plant establishment and maintenance period the contractor shall maintain in tact the construction fencing. The contractor shall place every two hundred feet of no trespassing signs on the construction fencing.

10.1.2. Turf Maintenance

- a. Contractor shall mow weekly or more if needed all turf areas to a height between 1" to 1 ½" for Bermuda turf blends and 2 ½" for Fescue turf mixes.
- b. Contractor shall edge turf areas biweekly or more if needed.
- c. All clippings must be removed from sidewalks or adjacent areas.
- d. Contractor shall remove all excess clipping from turf areas.
- e. Contractor shall monitor watering to all turf areas and provide sufficient moisture levels to all turf areas. The contractor shall submit a daily report of watering or irrigation repair needs to the City via fax.

10.1.3. Tree and Shrub Maintenance

- a. Contractor shall remove any dead growth on all trees and shrubs as needed.
- b. No stripping of lower branches from any tree or shrub unless directed by the engineer.
- c. Trees and shrubs shall be pruned as directed by the engineer.
- d. No topping of any tree is allowed unless directed by the engineer.
- e. Contractor shall remove tree stakes when stakes are no longer needed.

10.1.4. Weed Control

- a. All tree and shrub basins and all areas must be weed free.
- b. Contractor shall apply pre-emergent herbicide where possible to prevent weeds as directed by a licensed pest control consultant.
- c. Contractor shall remove all weed from site manually or chemically.

10.1.5. Rodent Control

- a. Contractor shall be responsible for maintaining a rodent free project.

- b. All measures to eradicate rodents must be as directed by a licensed pest control consultant.
- c. Contractor shall repair/replace all damaged caused by rodents under this section.

10.1.6. Fertilization

- a. Contractor shall fertilize turf, slope and planter areas every 30 calendar days with approved fertilizer at the manufacturer's recommended application rate.
- b. Fertilizer formulations shall be as recommended by the soils testing. Prior to applying fertilizers, the fertilizer formulations and application methods shall be approved by the City.

10.1.7. Maintenance General

- a. Edge groundcover as needed to maintain no growth over sidewalks, around tree and shrub basins or up walls or fences.
- b. Remove all trash weekly.
- c. Hand pull weeds in planting areas.
- d. Test complete irrigation system biweekly.

10.1.8. Clean-Up

- a. Clean up shall take place on a daily basis, after each portion of work has been completed and as directed by the Owner's representative. The contractor shall legally remove from site any trash or material from his scope of work.

- END OF SECTION -