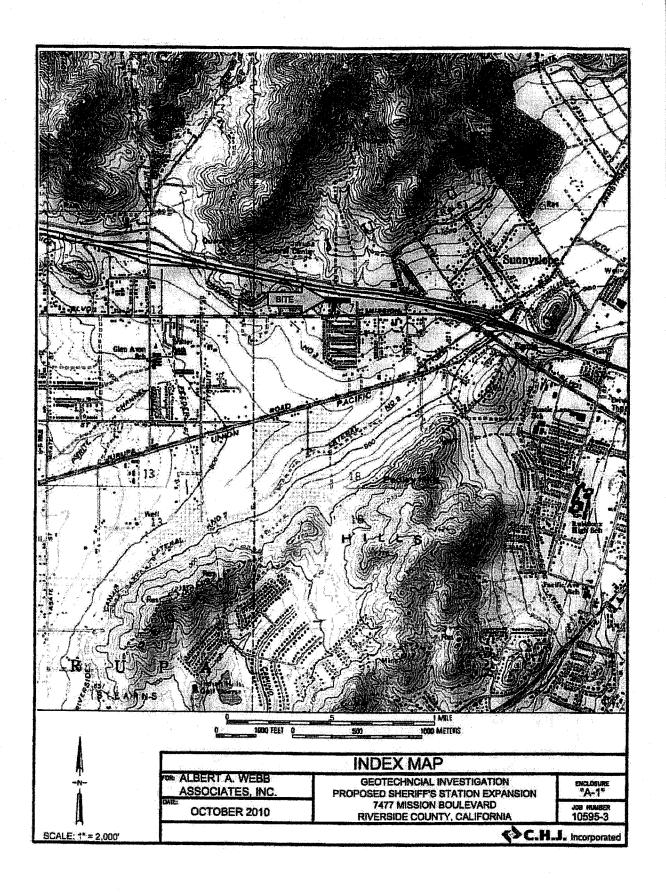
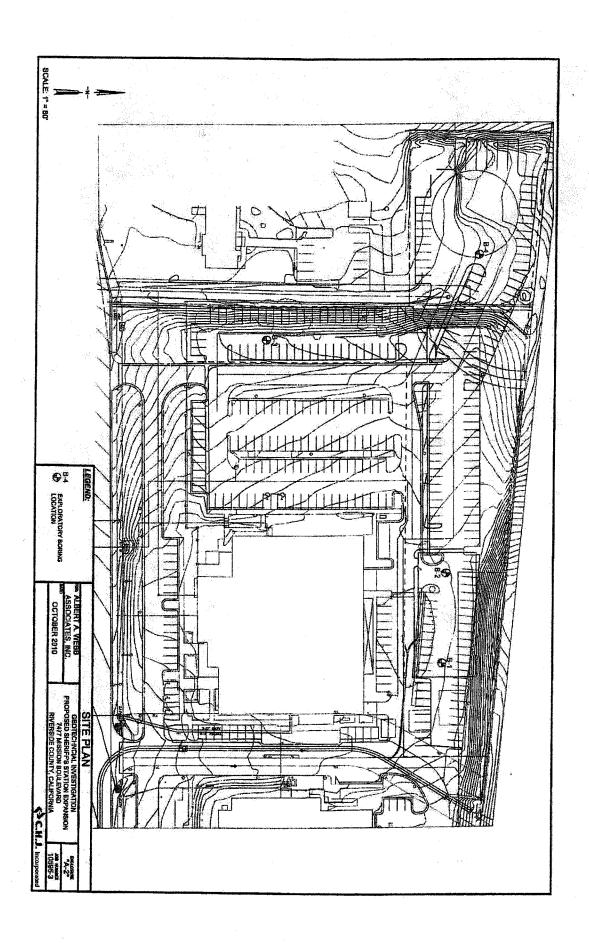


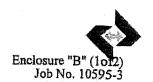
APPENDIX "A" GEOTECHNICAL MAPS







APPENDIX "B" EXPLORATORY LOGS



KEY TO LOGS

LEGEND OF LAB/FIELD TESTS:

Blows A measure of the penetration resistance of soil expressed as the number of hammer blows required to advance the indicated sampler 6 inches (or less if noted). Samplers are driven with an automatic hammer that drops a 140-pound weight 30 inches for each blow. After the required seating, samplers are advanced up to 18 inches ahead of the boring, providing up to 3 sets of blows per drive.

Bulk Indicates Disturbed or Bulk Sample

Cor. Chemical/Corrosivity Tests

DS Direct Shear Test (ASTM D 3080)

MDC Maximum Density Optimum Moisture Determination (ASTM D 1557)

N.R. Indicates No Recovery of Sample

Ring Indicates Relatively Undisturbed Ring Sample. Relatively Undisturbed Ring Samples are obtained with a "Modified California Sampler" (3.25" O.D. and 2.42" I.D.) lined with rings driven with a 140-pound weight falling 30 inches.

RV R-value (Caltrans 301)

SA Sieve Analysis (ASTM D 422)

SE Sand Equivalent Test (ASTM D 2419)

C.H.J. Incorporated

SOIL CLASSIFICATION CHART

		CACOLOGICA	SYMBOL	SYMBOL	TYPICAL DESCRIPTIONS						
-	GRAVEL AND	CLEAN GRAVELS		8	WELL-GRADED GRAVELS, GRAVEL-SAND MKTURES, LITTE OR NO FINES			GRADAT	GRADATION CHART	.	
	SOILS	CITTLE OR NO FINES)	器	8	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTHRES, 1 ITH F OB NY FINES				PARTIC	PARTICLE SIZE	
COARSE			がなり				MATERIAL SIZE	LOWER LIMIT	LIMIT	UPPERLIMIT	LIMIT
	MORE THAN 50%	OPAVELS WITH FINER		No.	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	SAND	FINE	MALIMETERS .074	SIEVE SIZE	MILLIMETERS 0.42	SIEVE SIZE
<u> </u>	TOW RELEASE	(APPRECIABLE AMOUNT OF FINES)		g	CLAYEY GRAVELS, GRAVEL-SAND-CLAY		COARSE	2	#10×	4.76	#4x
			W.		MKTARES	TAVANO	FINE	4,78	* 4 X	191	316
	SAND		10 to	MS	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	<u>8318800</u>	COARSE	78.2	34.	304.8	
•	AND	A ITTHE CORNER PINES				BOULDERS	ERS	304.8	12	914.4	æ
	SORE			&	POORLY-GRADED BANDS, GRAVELY SANDS, LITTLE OR NO FINES	*	* US STANDARD	* CLEARS	* CLEAR SCILARE OPENINGS		
MORE THAN 50%. OF MATERIAL IS AROSEN THAN NO. 208 SIEVE 9725	RE THEN SOY.	SANDS WITH		S.	SITLY SANDS, SAND-SH,T MIKTURES						
(F°	TOW PASSENG NO. 4 SERVE	(APPRECIABLE AMOUNT OF PINES)		28	CLAYEY SANDB, SAND-CLAY MUCTURES	•		PLASTIC	Y CHAR		
-					Managaria and the same of the same	0	10 20	30 40	8	70 80 90	001
***************************************				¥	FROM FLOUR, SILV OR CLAYEY FINE SANDS OR CLAYEY WITH SLASH PLASTICITY	3					
FINE GRANED SOILS	SALTS AND CLAYS	LESS THAN 50		ಠ	MORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS. SANDY CLAYS, SILTY CLAYS. LEAN CLAYS				푱	1	
	**************************************			ਰੰ	MANIC SILTY STICITY	X3ON A			SINITE		
				H	PROFIGANIC SILTY, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SGILS	MRD-MPI MRD-MPI TIDITEALI		ಕ			1
OF MATERIAL IS MALER THANKO ZIO SEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		ð	MORGANIC CLAYS OF HIGH PLASICITY, FAT CLAYS				¥	5	
				동	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORICANIC SILTS	\$.		₩			
HGH.	HIGHLY ORGANIC SOILS	Solus		£	PEAT, HUMUS, SWANP BOILS WITH HIGH ORGANIC CONTENTS						7
			-				UNIFIED S	UNIFIED SOIL CLASSIFICATION SYSTEM	SIFICATION	VSYSTEM	

Date Drilled: 10/14/10

Client: Albert A Webb Associates

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lbs./30 in.

Surface Elevation(ft): N/A

Logged by: DM

Measured Depth to Water(ft): N/A

- 1				T	T				1	1//A
	рертн (#)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	DRIVE	BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
L		Carl Sales Dec	3-1/2" Asphalt Concrete, 5" Aggregate Base	Asphali	1			1		
-	, , ,		(SM) Silty Sand, fine to medium with coarse brown	Base Native	X		30 38 50/5"	3.2 2.9	114	SA, MDC, DS, Cor. Ring
	- 5				X		34 50/6*	4.1	113	Ring
	10 -				X		27 50/6*	4.5	112	Ring
	15 -		(SM) Silty Sand, fine to medium with coarse, brown		X	***	26 50	4.1 3.2	127	Ring
Ļ	1	j	END OF BORING				3U	.		
11/3/10	20 -	And the second s	NO REFUSAL, NO BEDROCK NO FILL, NO CAVING NO FREE GROUNDWATER	The second secon				and the second s		AND COMPANY AND ADMINISTRATING THE PARTY OF
Mary Charles	25 -	of many state of the state of t		٥			***************************************	Arry - Transport Property and P		
DEFIL 113 PAR CAREER WALLE TO THE TANK	30 -	And a control of the second se				***************************************			The second secon	
	35 -							*		

€ C.H.J.

SHERIFF'S STATION EXPANSION 7477 MISSION BLVD, RIVERSIDE COUNTY, CA Job No. Enclosure 10595-3 B-1

Date Drilled: 10/14/10

Client: Albert A Webb Associates

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lbs./30 in.

Surface Elevation(ft): N/A

Logged by: DM

Measured Depth to Water(ft): N/A

~			S	SAN	PLES	Z	(%)	T WT.	Q
DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	DRIVE	BULK	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT ((pcf)	LAB/FIELD TESTS
	5475 55	3" Asphalt Concrete, 4" Aggregate Base	Asphalt	Π	525X		2.3		
4		(SM) Silty Sand, fine to coarse with gravel to 3/4", brown	Base Native	X		15 27 38	4.4	116	SA, MDC DS, Cor. Ring
5 -		(SM) Silty Sand, fine to medium with coarse, brown			22202	36	3.4		
			*	L		16	3.4	121	Ring
,				X		16 30 45		1#1	King
10 -									
į		END OF BORING		X		20 38 50/5"	3.8	128	Ring
15 -									
ļ		NO REFUSAL, NO BEDROCK NO FILL, NO CAVING NO FREE GROUNDWATER							
20 -									
•									
*		·							
25 -									
,									
30 -									
•									
35 -									
		SHERIFF'S STATION EXPAN	laror:				In	No F	inclosur

Date Drilled: 10/14/10

Client: Albert A Webb Associates

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lbs./30 in.

Surface Elevation(ft): N/A

Logged by: DM

Measured Depth to Water(ft): N/A

VISUAL CLASSIFICATION WHAT DOT CLASSIFICATION (SM) Silty Sand, fine to medium with coarse, brown (SM) Silty Sand, fine to medium with coarse, dark gray	evite REMARKS	DRIVE BULK	S/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD
(SM) Silty Sand, fine to medium with coarse, dark gray		X	8	4.6		
	Native		28	5.6	137	RV RV Ring
			1	6.8	130	Ring
(SM) Silty Sand, fine to medium with coarse, brown		X	29 31 34	4.1		ХШ Б
END OF BORING			6 5 6	3.3	117	Ring
NO REFUSAL, NO BEDROCK FILL TO 3.0', NO CAVING NO FREE GROUNDWATER						
20 -						
25 -	٠			***************************************		
30 -					MARIO DE PROPERTO DE LA COMPANSA DE	
35 -						

€Љ С.Н.Ј.

SHERIFF'S STATION EXPANSION 7477 MISSION BLVD, RIVERSIDE COUNTY, CA Job No. Enclosure 10595-3 B-3

Date Drilled: 10/14/10

Client: Albert A Webb Associates

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lbs./30 in.

Surface Elevation(ft): N/A

Logged by: DM

Measured Depth to Water(ft): N/A

ДЕРТН (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	DRIVE	BULK 🖁	BLOWS/6 IN.	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with coarse, brown	Fili	1	2000		5.8		SO, SE, RV
			.		SON N				
		(SM) Silty Sand, fine to medium, brown	Native	X	6000	2 2 4	5.8 7.1	110	Ring
- 5		(SM) Silty Sand, fine to medium with coarse, red brown	1		2880		4.7		
				X		27 50/5*	4.6	127	Ring
1	4	END OF BORING							
- 10 ·		NO REFUSAL, NO BEDROCK FILL TO 2.0', NO CAVING NO FREE GROUNDWATER							
t	1						-		
- 15]		•						
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}	-								
†	4		1						
- 20	1								
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b	<u> </u>	. CUEDIERC CTATION EVEAT	JOYANI				Jo	b No. E	nclosure

C.H.J.

SHERIFF'S STATION EXPANSION
7477 MISSION BLVD, RIVERSIDE COUNTY, CA

Job No. Enclosure



APPENDIX "C" LABORATORY TESTING

TEST DATA SUMMARY

OPTIMUM MOISTURE - MAXIMUM DENSITY RELATION:

(ASTM D 1557)

Sample No. Depth (ft) Classification Optimum Moisture Max. Dry Density (%) (pcf)

1A+2A 0.5 to 1.5 (SM) Silty sand, fine to medium with coarse, brown 7.5 136.5

DIRECT SHEAR TEST - Undisturbed: (Sniurated)

(ASTM D 3080)

Boring No. Depth (ft) Angle of Internal Priction (*) Apparent Cohesion (psf)

1A+2A 0.5 to 1.5 30 0

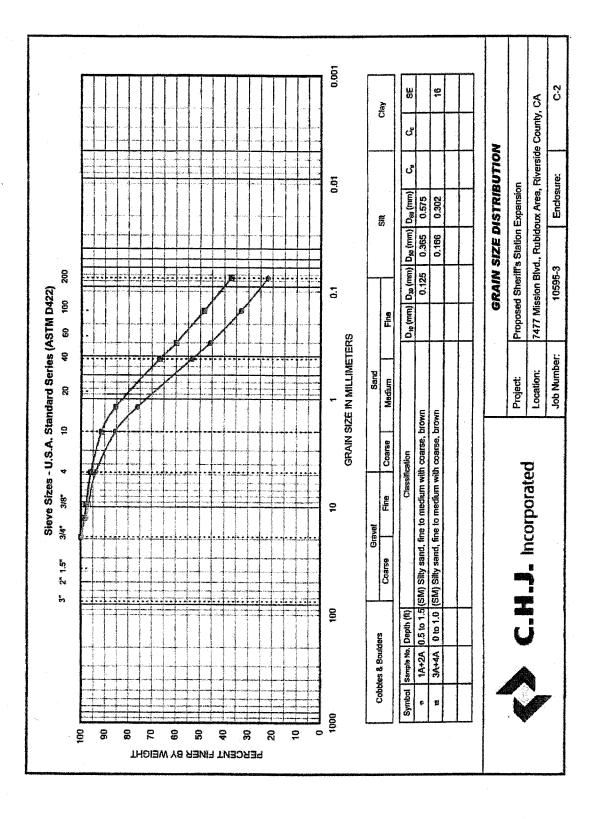


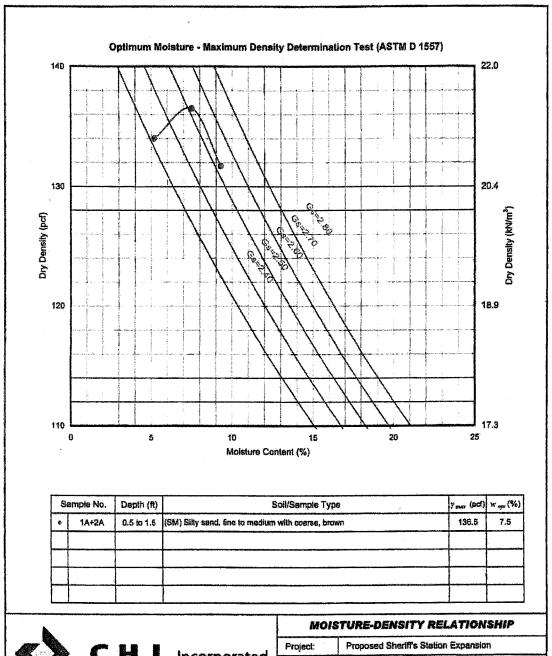
	TEST DATA	SUMMARY	
Project:	Proposed Sherif	l's Station Expans	ilon
Location:	7477 Mission Blvd.	Rubidoux Area, Rive	rside County, CA
Job No.:	10595-3	Enclosure:	C-1

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Prepared at 10/25/2010







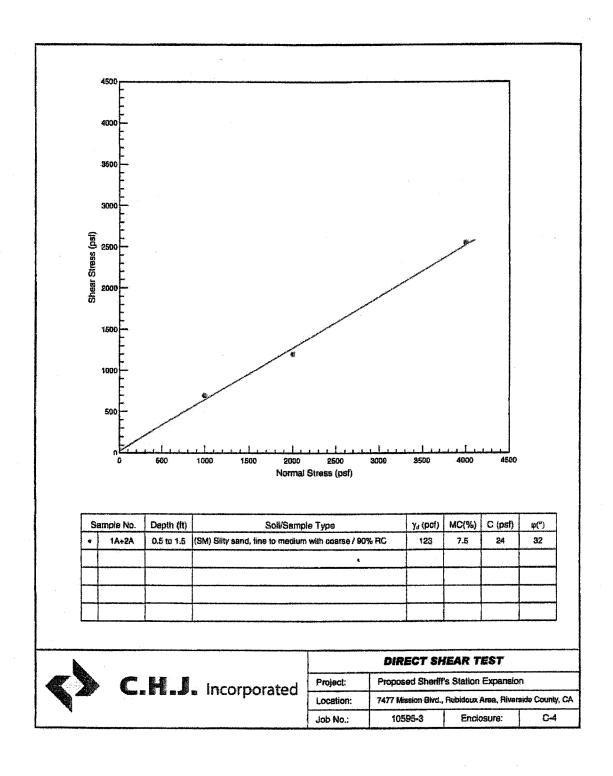
C.H.J. Incorporated

MOI	STURE-DENSI	TY RELATION	SHIP
Project:	Proposed Sheriff	's Station Expansion	1
Location:	7477 Mission Blvd.	Rubidoux Area, River	side County, CA
Job No.:	10595-3	Enclosure:	C-3

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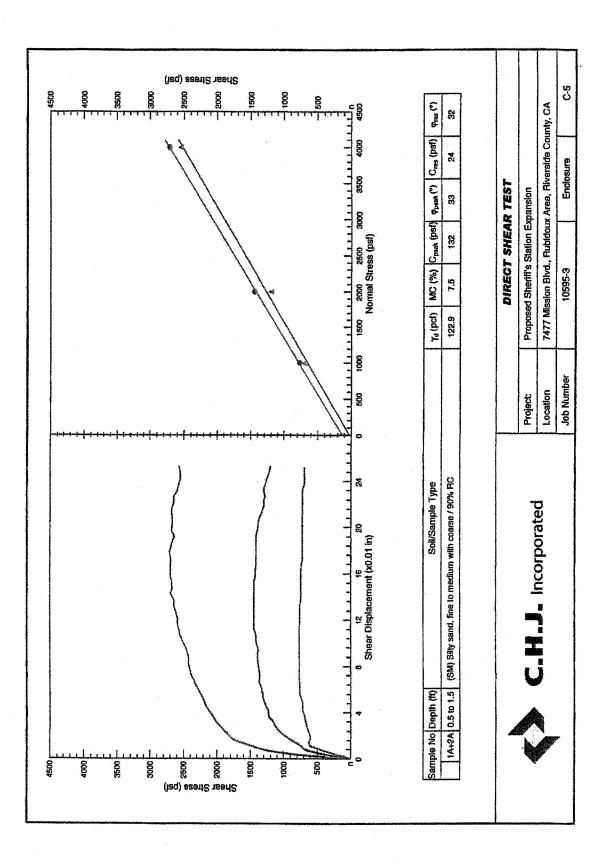
Prepared at 10/29/2010



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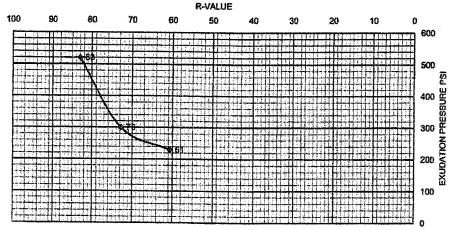
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Prepares at 10/29/2010



Traffic Index (T.I.) 5.0	A	8	С	D
COMPACTOR AIR PRESSURE P.S.I.	350	350	350	
INITIAL MOISTURE %	5.8	5.8	5.8	
WATER ADDED, ML	40	35	30	
WATER ADDED %	3.6	3.2	2.7	
MOISTURE AT COMPACTION %	9.4	9.0	8.5	
HEIGHT OF BRIQUETTE	2.53	2.50	2.51	H
WET WEIGHT OF BRIQUETTE	1184	1168	1169	
DENSITY LB. PER CU.FT.	129.6	129.9	130.0	
STABILOMETER PH AT 1000 LBS.	20	11	. 5	
2000 LBS.	38	24	13	
DISPLACEMENT	5,20	5.30	5.80	
R-VALUE	61	73	83	*********
EXUDATION PRESSURE	230	300	520	
THICK, INDICATED BY STAB.	0.63	0.44	0.27	
EXPANSION PRESSURE	0	0	0	
THICK, INDIGATED BY E.P.	0.00	0.00	0.00	

EXUDATION CHART



R-Value:

Sample No.	Depth (ft)	Soll/Sample Type	SE	wo(%)	
3A+4A		(SM) Sity sand, fine to medium with coarse, brown	16	5.8	



C.H.J. incorporated

		R-VALUE	ETEST	
	Project:	Proposed Sheri	ff's Station Expans	ilon
	Location:	7477 Mission Blvd.	, Rubidoux Area, Rive	rside County, CA
-	Job No.:	10595-3	Enclosure:	C-6

CHJØ LabSuda ver3.01 Programmed by Fred Y. PhD, PE

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ASPHALT CONCRETE STRUCTURAL SECTION DESIGN

R-Value used	50	

Traffic Index (T.l.)	Recommended	Street Sections
5.00	0.25' AC / 0.35' AB Class 2	0.35' AC / Native
5,50	0.25' AC / 0.35' AB Class 2	0.40' AC / Native
6.00	0.25' AC / 0.35' AB Class 2	0.45' AC / Native
6.50	0.30' AC / 0.35' AB Class 2	0.50' AC / Native
7.00	0.30' AC / 0.40' AB Class 2	0.55'-AC / Native
7.50	0.35' AC / 0.45' AB Class 2	0.65' AC / Native
8.00	0.40' AC / 0.45' AB Class 2	0.70' AC / Native
8.50	0.40' AC / 0.50' AB Class 2	0.75° AC / Native
9.00	0.45' AC / 0.55' AB Class 2	0.80' AC / Native
9.50	0.45' AC / 0.60' AB Class 2	0.90' AC / Native
10.00	0.50' AC / 0.65' AB Class 2	0.95' AC / Native
10.50	0.55' AC / 0.65' AB Class 2	1.00' AC / Native
11.00	0.55' AC / 0.70' AB Class 2	1.05' AC / Native
11.50	0.60' AC / 0.75' AB Class 2	1.10' AC / Native
12.00	0.60' AC / 0.80' AB Class 2	1.20' AC / Native
12.50	0.65' AC / 0.85' AB Class 2	1.25' AC / Native
13.00	0.65' AC / 0.90' AB Class 2	1.30'.AC / Native
13.50	0.70' AC / 0.90' AB Class 2	1.35' AC / Native
14.00	0.70' AC / 0.95' AB Class 2	1.40' AC / Native

NOTE: MIN. A.C. THICKNESS IS 0.25' MIN. A.B. THICKNESS IS 0.35'

All thicknesses are rounded to the nearest 0.05 fool.

The above values may not reflect applicable county or city minimum standards.

A safety factor of 0.20 for the G.E. of the A.C. is included as per Caltrans.

The values also include a safety factor of 0.10 for A.C./ native soil.

Some agencies do not permit placing A.C. over native soli.



1	AC STRUCTURAL SECTION DESIGN					
	Project:	Proposed Sheriff's Station Expansion				
	Location:	7477 Mission Bivd., Rubidoux Area, Riverside County,				
	Job No.:	10595-3	Enclosure:	C-7		

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Prepared at 10/29/2010



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Table 1 - Laboratory Tests on Soil Sample(s)

C.H.J., Inc. Sheriff Substation Your #10595-3, SA #10-1094LAB 19-Oct-10

Sample ID

30 A. ut is 2				
Resistivity as-received		Units ohm-cm	52,000	
saturated		ohm-cm	6,000	
рН			8.4	
Electrical				
Conductivity		mS/cm	0.07	
Chemical Analys	ies			
Cations				
calcium	Ca ²⁺	mg/kg	34	
magnesium	Mg ²⁴	mg/kg	10	
sodium	Na ¹⁺	mg/kg	51	
potassium	KI+	mg/kg	6.2	
Anions				
carbonate	CO ₃ 2-	mg/kg	12	
bicarbonate	HCO ₃	mg/kg	112	
fluoride	Fi.	mg/kg	3.0	
chloride	CI1-	mg/kg	3.1	
sul fate	SO, 3.	mg/kg	17	· •
phosphate	PO.3	mg/kg	ND	
Other Tests				
ammonium	NH41+	mg/kg	ND	
nitrate	NO311	mg/kg	15	
sulfide	S_3 .	qual	na	
Redox		mV	na	

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract. mg/kg = milligrams per kilogram (parts per million) of dry soil. Redox = oxidation-reduction potential in millivolts ND = not detected

na = not analyzed

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Page 1 of 1

SECTION 01730

OPERATION AND MAINTENANCE ITEMS

PART 1 -- GENERAL

1.01 SUMMARY

- A. Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.
- B. Work Included: To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in pertinent other Sections of these Specifications.

1.02 QUALITY ASSURANCE

In preparing data required by this Section, use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this Section, and skilled in technical writing to the extent needed for communicating the essential data.

1.03 SUBTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions, Project Manual Section 00700.

1.04 SUBMITTALS

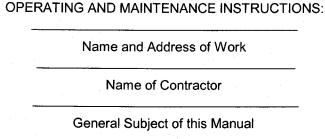
- A. In accordance with Article 5 of the General Conditions.
- B. Submit two copies of a preliminary draft of the proposed Manual or Manuals to the Architect for review and comments.
- C. Unless otherwise directed in other Sections, or in writing by the Architect, submit (3) three copies of the final Manual to the Architect prior to indoctrination of operation and maintenance personnel.

PART 2 -- PRODUCTS

2.01 OPERATION MANUALS

- A. Where instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.
- B. Reference Chart: See Section 01900 List of Project Close-Out Items for summary of Sections that require submittal of Operation Manuals.
- C. Format:
 - 1. Size: 8-1/2" x 11"
 - 2. Paper: White bond, at least 20 lb. weight
 - 3. Text: Neatly written or printed
 - 4. Drawings: 11" in height preferable; bind in with text; fold-out acceptable; larger drawings acceptable but fold to fit within the Manual and provide a drawing pocket inside rear cover or bind in with text.
 - 5. Flysheets: Separate each portion of the Manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.

- 6. Binding:Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the Manual; 3-ring binders will be acceptable; all binding is subject to the Architect's acceptance.
- 7. Measurements: Provide all measurements in U.S. standard units such as feet-and-inches, lbs., and cfm.
- D. Provide front and back covers for each Manual, using durable material accepted by the Architect, and clearly identified on or through the cover with at least the following information:



Space for Signature of the Architect and Date

- E. Contents: Include at least the following:
 - 1. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of all emergency information regarding the installation.
 - 2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.
 - 3. Complete nomenclature of all parts of all equipment.
 - 4. Complete nomenclature and part number of all replacement parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
 - 5. Copy of all guarantees and warranties issued.
 - 6. Manufacturer's bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturer's data with which this installation is not concerned.
 - 7. Such other data as required in pertinent Sections of these Specifications.

2.02 INSTRUCTION MANUALS

- A. Preliminary:
 - 1. Prepare a preliminary draft of each proposed Manual.
 - 2. Show general arrangement, nature of contents in each portion, probable number of drawings and their size, and proposed method of binding and covering.
 - 3. Secure the Architect's acceptance prior to proceeding.
- B. Final: Complete the Manuals in strict accordance with the accepted preliminary drafts and the Architect's review comments.
- C. Revisions: Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the Manual with the Architect.

*** END OF SECTION***

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SECTION 02070

SELECTIVE DEMOLITION AND RECONSTRUCTION

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. Work included:

- 1. Carefully demolish and remove from the site those items scheduled to be so demolished and removed. Furnish materials and perform labor required to execute this work as required by the Drawings and/or as specified and as necessary to complete the Contract, including, but not limited to, these major items:
 - a. Protection of existing work to remain.
 - b. Barricades, lights, signs and safety precautions required by governing codes.
 - c. Removal and disposition of all material resulting from this work, except materials to be stored for Owner.
 - d. Patching as necessary to match existing.
 - e. Saw-cutting existing concrete and asphalt concrete.
 - f. Protection of existing vegetation or shrubbery to remain.
 - g. Cleaning existing items to remain.
 - h. Relocation of existing items as necessary to provide for new construction and as required by the Drawings.
 - i. Removal and/or relocation of utility lines (water, electric, sewer) as required by the Drawings, and such lines not shown but encountered in the course of the work.
 - j. Removal and/or relocation of existing irrigation lines.

B. Related work:

- 1. Documents affecting work of this Section include, but are not necessarily limited to Special Conditions, and Sections in Division 1 of these Specifications.
- All new work.

1.03 GENERAL REQUIREMENTS

- A. Codes: Perform all work in accordance with the Codes listed in 1.33 of General Conditions and as required by local governing authority.
- B. All bidders submitting bids for this work shall first examine the site and all conditions and limitations thereon and thereabouts. Bid shall take into account all such conditions and limitations, whether or not the same are specifically mentioned in any of the contract documents and every bid shall be construed as including whatever sums are needed to complete the work in every part as shown, described, or reasonably required or implied, and attain the completed conditions contemplated by the Contract. The demolition drawings, including demolition work shown on construction drawings, shall be considered as a guide only. The exact extent of the demolition and reconstruction work shall be determined by a site visit and investigation.

- C. Partial removal: Items scheduled to be removed and of salvageable value to Contractor, excluding those items to be retained by the Owners, may be removed from the structure as work progresses. Salvaged items must be transported from site as they are removed.
 - Storage or sale of removed items on site will not be permitted.
- D. Noise control: Carry on all work in a manner which will produce the least amount of noise. Instruct all workmen in noise control procedures.
- E. Items of existing work indicated to remain upon completion of the Contract, but which require removal to complete the work, shall be carefully removed and replaced upon completion. The replaced work shall match its condition at the start of the work.

1.04 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.06 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Schedule: Submit proposed methods and operations of building demolition to Architect for review prior to start of work. Include in schedule coordination for shut-off, capping, and continuation of utility services as required.

PART 2 -- PRODUCTS

As necessary for proper completion of this Work.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 GENERAL PROVISIONS

- A By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.
- B In company with the Architect and Owner, after receiving Notice to Proceed, visit the site and verify the extent and location of selective demolition required.
 - Carefully identify limits of selective demolition.
 - 2. Mark interface surfaces as required to enable workmen also to identify items to be removed and items to be left in place intact.
- C. Take into consideration as necessary work, all obvious existing conditions and installations on the site as though they were completely shown or described. Accept the site of the work as it exists and clear obstructions to the work shown.
- D. Examine the site and all conditions and limitations thereon and thereabouts. Take into account all such existing conditions and limitations whether or not the same are specifically shown or mentioned in any of the Contract Documents and include whatever

is needed to complete the work in every part as shown, described or reasonably required or implied to attain the completed condition contemplated by the Contract.

- E. Prepare and follow an organized plan for demolition and removal of items.
 - 1. Shut off, cap, and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction. Review plans, and confer with the Architect, to determine which lines are to be abandoned and which are to be kept active.
 - 2. Completely remove items scheduled to be so demolished and removed, leaving surfaces clean, solid, and ready to receive new materials specified in other Sections of these Specifications.
 - 3. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.
- F. Demolished material shall be considered to property of the Contractor and shall be completely removed from the job site. Do not store or permit debris to accumulate on the site. Burning of removed materials from demolished operations will not be permitted on site.

3.03 POLLUTION CONTROLS

- A. Use temporary enclosures and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
- B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by Architect or governing authorities. Return adjacent areas to condition existing prior to start of work.

3.04 PROTECTION

- A. Site security: Erect wire or solid wood fences, barricades, warning lights and signs as required by the governing building code, to protect all manner of person from injury, to prevent trespassing, and to prevent theft or damage to the work.
- B. Protection of work to remain: Use stakes, barricades, and such other means of protection as required to prevent damage to existing work and equipment to remain.
- C. Protect all landscaping scheduled to remain.
- D. Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.
 - 1. Erect temporary covered passageways as required by authorities having jurisdiction.
 - 2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of building structure to remain.

3.05 TRAFFIC

- A. Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- B. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

3.06 UTILITY SERVICES

A. Maintain existing utilities, keep in service, and protect against damage during demolition operations.

B. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

3.07 REPLACEMENTS

- A. In the event of demolition of items not so scheduled to be demolished, promptly replace such items to the acceptance of the Architect and at no additional cost to the Owner.
- B. Patch and fill holes caused by removal of piping and conduit in concrete slabs, and concrete walls with 3,000 psi concrete; level flush with adjacent surfaces.

3.08 ASPHALT CONCRETE PAVEMENT

All asphalt concrete pavement damaged, cut, trenched, etc. and any base material under the pavement shall be replaced and/or repaired using same specifications as existing pavement.

3.09 REMOVED MATERIALS TO BE SALVAGED OR REUSED

- A. Materials to be salvaged will be noted as such on the Construction Drawings. Existing Vertical blinds shall be included in salvage. Where room sizes match blind sizes, Contractor to include reinstallation of blinds as directed by Owner. Blinds shall be cleaned prior to reinstallation.
- B. Exercise extreme care when removing materials to be salvaged or reused. Use only mechanics skilled in the appropriate crafts.
- C. Store and protect salvaged materials until needed to be re-installed on the project, or deliver to Owner in good condition.

3.010 DEMOLITION

- A. Asphalt Concrete: Remove existing asphalt concrete and base material scheduled to be removed and prepare surface in accordance with Section 02510. All edges shall be sawcut in straight and true lines.
- B. Concrete: Exercise due caution in cutting and/or patching concrete so as not to damage or deface that portion of the existing structure which is to remain. Should any such impairment occur, immediately clean or restore to original condition at no cost to Owner.

3.011 RECONSTRUCTION - GENERAL

- A. By careful study of the Contract Documents, determine the location and extent of reconstruction to be performed.
- B. In company with the Architect, visit the site and verify the extent and location of reconstruction required.
- Inspect existing surfaces to determine required surface preparation procedures.
- D. Plumbing and Electrical: In any case where a new line may tie into and extend existing line within the limits of the reconstruction Work, Contractor shall examine the entire existing line and determine whether the new Work will be adversely affected by it, and notify Architect of any such defect before tying in.

3.012 IN ALL RECONSTRUCTION WORK

Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

END OF SECTION

SECTION 02110

CLEARING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work included: The site shall be cleared and grubbed in preparation for the required Work of this Contract, as specified herein.

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

In accordance with Article 5 of the General Conditions.

PART 2 -- PRODUCTS

2.01 MATERIALS

Provide materials, not specifically described but required for proper completion of the work of this Section, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 PROTECTION

- A. Protect existing utilities indicated or made known.
- B. Protect trees and shrubs, where indicated to remain, by providing a fence around the tree or shrub of sufficient distance away and of sufficient height so trees and shrubs will not be damaged in any way as part of this Work.
- C. Protection of persons and property:
 - 1. Barricade open depressions and holes occurring as part of this Work, and post warning lights on property adjacent to or with public access.
 - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

- 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this Section.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to the site at all times.

3.03 CLEARING

Strip the site of roots, shrubs, grass, grass roots, or any other organic material. Remove roots of shrubs to depth of 24 inches and roots of trees completely. Contractor shall visit the site prior to Bid to ascertain extent of existing to be removed.

3.04 DISPOSAL

General:

- 1. Remove brush, grass, roots, trash, and other material from clearing operations.
- 2. Dispose away from the site in a legal manner consider green recycling facilities in the area.
- 3. Do not store or permit debris to accumulate on the job site.

3.05 UTILITIES

- A. Coordinate with utility companies and agencies as required.
- B. Where utility cutting, capping, or plugging is required, perform such work in accordance with requirements of the utility company or governmental agency having jurisdiction.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Perform all Excavating, Backfilling and Grading as shown on the Drawings as specified herein, and as specified in the standard specifications for Public Works Construction (Green Book) latest edition.

1.03 CONDITIONS AT SITE

A. Visit the site. Examine and note all conditions as to the character and extent of Work involved.

B. EXISTING UTILITIES

- 1. Where existing utilities (not shown on the Drawings) are encountered, support, shore-up, protect same and immediately notify Architect. Allow entrance opportunity and ample time for measures necessary for continuance and/or relocation of such services.
- 2. Where noted on Drawings, cut and cap all street connections encountered in the excavating along curb line and mark location so they can subsequently be located and reconnected as required.

C. ADJACENT PROPERTY

1. Restore any damage to adjacent properties, streets and the like caused by operations of this Section to original condition without additional cost to Owner.

1.04 QUALITY CONTROL

A. PERMITS & ORDINANCES

- 1. Procure all necessary permits or certificates required by local authorities having jurisdiction over the Work.
- Comply with all applicable Federal, State and Local ordinances.

B. TESTS, INSPECTIONS AND SUPERVISION

- 1. Contractor shall provide Construction Grade Stakes for rough grade, pad blue tops and fine grading of landscape berms.
- 2. Contractor shall preserve stakes.
- 3. Site Work Contractor shall give the Work his personal supervision. In his absence he shall leave a responsible representative in charge who shall have the authority to receive and execute orders from the Architect, or his representative.

1.05 DEMOLITION AND SITE CLEARING

- A. The site shall be cleared and prepared for fill material in accordance with the Soil Report. Contractor shall visit the site prior to Bid to ascertain extent of existing to be removed.
- B. Saw-cut and remove all asphalt paving and concrete curbs, etc., as indicated on the Drawings and as required.
- C. Remove all material and legally dispose of it off the site.

- D. Repair any damage done to Owner's property or property of others on or off the premises as a result of the work.
- E. Do not close or obstruct streets, sidewalks, drives, etc. without permission, or store materials in same.
- F. Upon completion of this work, remove temporary protective devices, tools, materials, equipment and rubbish of every sort and leave site in neat and orderly condition.

1.06 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.07 SUBMITTALS

In accordance with Article 5 of the General Conditions.

PART 2 -- PRODUCTS

2.01 BACKFILL

Provide according to the requirements of the Soils Report.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 LAYOUT

Layout of all work under this Section shall be made by a survey crew as engaged by the Contractor.

3.03 PUMPING AND DRAINAGE

- A. Keep all excavations, pits, trenches, footings, etc., entirely free from water.
- B. Protect excavations from rain or water from any source during construction. Use suitable pumping equipment or other means as required by conditions. Continue pumping as necessary until completion of project or until released by Construction Manager.
- C. When operations are interrupted by unfavorable weather conditions, prepare areas by grading and compaction to avoid ponding and erosion.

3.04 SITE PREPARATION

As per Soils Investigation Report.

3.05 EXCAVATION

A. <u>Detention Basin:</u> Excavate the detention basin to the dimensions and contours shown on the grading plan and place the fill material on the site as needed. The Contractor shall fine grade the detention basin soon after beginning of construction to prepare for the scope of work by the Landscape Contractor.

- B. Excavate to depths noted on Drawings, as required for proper completion of all footings and other subgrade level Work, and cut to sufficient size to provide ample room for construction of forms, shoring and bulk-heading as required.
- C. Backfill any excess excavation under footings with concrete at Contractor's expense.
- D. Shore and brace excavations where necessary to prevent cave-ins, and in accordance with all safety laws and codes.

3.06 TRENCHING

For undergrounding piping, electrical conduits, etc., shall be done by the trade installing the pipes, conduits, etc. Backfilling of trenches shall be accomplished with native material backfilled to a relative compaction of 90 percent in accordance with ASTM D-1557.

3.07 STOCKPILE AREAS

Excavated or imported materials to be used as backfill or fill shall be stockpiled within the working areas. Contractor shall not interfere with the Work of other Contractors and shall not stockpile material within 10 feet of new construction or existing construction to remain.

3.08 BACKFILL AROUND STRUCTURE

Place earth backfill suitable to support planting and landscape materials around structure. Deposit backfill material in horizontal lifts according to the Soils Report.

3.09 BACKFILL OR FILL IN ASPHALT OR CONCRETE AREAS

Unless otherwise instructed by the Soils Report, where finish grade is designated to be concrete, place Class 2 base backfill to subgrade elevations shown. Deposit in horizontal lifts not exceeding 8 inches loose thickness and compact each lift to not less than 90% relative compaction to within 12 inches of subgrade elevation. Relative compaction shall be 95% in the top 12 inches below subgrade elevations.

3.010 LANDSCAPING PLANTER AREAS

Unless otherwise instructed by the Soils Report, construct planters of select landscape fill to the lines, grades and contours shown, allowing for thickness of any topsoil to be provided by the Landscape Contractor. Place material in loose lifts not exceeding 12 inches in thickness and compact each lift to 85% relative compaction. Make surfaces free of exposed roots and stones. Toes of slopes shall flare evenly and smoothly into surrounding surfaces. Final locations and contours shall be approved by Architect.

3.011 COMPACTION TESTS

Field tests of in-place density and moisture content shall be conducted in accordance with the soils report.

3.012 SETTLEMENT

Any settlement in backfill or fill, which occurs during the warranty period and is attributable to construction procedures, such as improper removal of shoring or insufficient compaction shall be corrected by Contractor at his own expense. Any structures, paved areas, piping or other facilities damaged by such settlement shall be restored to their condition prior to settlement by Contractor at his own expense.

3.013 FINISH GRADING

Perform all finish grading required, as indicated or reasonably inferred to permit installation of Work of others as shown on Drawings. At completion of Work, entire site shall be left in a clean and finished condition conforming to plans and specifications.

3.014 CLEANING AND SURPLUS MATERIAL

A. Conduct Work in an orderly manner and so as not to create nuisance. Dirt shall not be permitted to accumulate on streets or sidewalks nor to be washed into sewers.

B. Remove from the site and legally dispose of all debris and excavated material not required for fill. No rubbish or debris shall be buried on the site.

3.015 TEMPORARY BLOWSAND CONTROL FENCING

- A. The Contractor shall install and maintain the temporary Blow Sand Control Fencing in the locations shown on the plans and as determined, during construction to be beneficial for workers on the site or to prevent complaints from neighboring property owners.
- B. This item is not intended to replace watering as a means of dust control.
- C. The fence material shall be an ultra violet resistant fabric specifically intended for the purpose of blow sand control. The materials, posts, method of attachment shall be reviewed and approved by the Owner prior to installation.

END OF SECTION

SECTION 02205

SOIL STABILIZER

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

- A. Perform all soil stabilization of soils as shown on the Drawings and as specified herein.
- B. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.

1.03 CONDITIONS AT SITE

- A. Visit the site. Examine and note all conditions as to the character and extent of Work involved.
- B. Perform selective demolition and excavation work per Sections 02070, 02200 and 02220 of these specifications.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

In accordance with Article 5 of the General Conditions.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Provide an organic-based chemical stabilizer that is a mixture of surfactant, buffer, and polyquaternaryamine in a polar vehicle.
- B. Provide "Soil Sta" as manufactured by Soil Sta, Inc. (214) 271-3243 or approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

- A. Drill holes in slab at a 10'-0" grid.
- B. Excavate perimeter foundation at 10'-0" on center with 3'-0" x 3'-0" x 3'-0" holes.

3.03 APPLICATION

A. Mix at a dilution of 1:50. Apply, with spray, at all areas of flat work at 1/8 gallon per square foot.

- Pressure inject soil stabilizer per manufacturer's recommendations. B.
- 3.04 **CLEAN-UP**

Remove all debris and excess material from site.

END OF SECTION

SECTION 02220

EXCAVATING, BACKFILLING AND COMPACTING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work included: Rough grading and compaction of the site and building pad areas to a tolerance of ± 0.10 of a foot. Excavate for foundations, backfill and compact as necessary and fine grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.

1.03 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 specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Soils Engineer.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Schedule: Submit proposed Products to Architect for review at least two weeks prior to start of work.

PART 2 -- PRODUCTS

2.01 SOILS MATERIALS

Fill and backfill materials:

- 1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps larger than 2" in their greatest dimension, and equal to the on-site material.
- 2. Fill material is subject to the acceptance of the Soils Engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soils free from roots and other deleterious matter.
- 3. Imported materials shall be tested and accepted by the Soils Engineer before being brought to the site.
- 4. Cohesion-less material used for structural backfill: Provide sand free from organic material and other foreign matter, and as accepted by the Soils Engineer.
- 5. Provide granular base under building slabs. Fine aggregate shall comply with requirements of Section 03300 of these Specifications.

2.02 WEED KILLER

- A. Provide a dry, free-flowing, dust-free chemical compound containing not less than 30% sodium chlorate or a chlorpyritos or Permethrin compound, non-flammable, not creating a fire hazard when applied in accordance with the manufacturer's recommendations, soluble in water, and capable of being spread dry or in solution. Chemical shall comply with Section 815-3.6 of FMA MP 5.
- B. Acceptable products:
 - 1. "Duraban TC":
 - "Dragnet":
 - 3. An approved equal will be accepted if substitution submitted according to Article 5 of the General Conditions.

2.03 TERMITE TREATMENT

Provide a dry, free-flowing, dust-free chemical compound, non-flammable, not creating a fire hazard when applied in accordance with the manufacturer's recommendations, soluble in water, and capable of being spread dry or in solution. Chemical shall comply with State of California requirements

2.04 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.
- E. If the Contractor encounters conditions at the site that (a) are materially different from those indicated in the contract plans or in specifications, or (b) could not have been reasonably anticipated as inherent in the work of the character provided in the contract, the Contractor shall immediately notify the Owner verbally and in writing within 24 hours. This notification shall be a condition precedent before any negotiations for "changed or differing site conditions" can proceed. If the Owner determines that conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, then negotiations shall commence between Owner and Contractor to provide equitable adjustment to Owner or Contractor resulting therefrom.

3.02 PROCEDURES

A. Utilities:

- Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
- 2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.

- 3. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.
- Do not proceed with permanent relocation of utilities until written instructions are received from the Architect.

B. Protection of persons and property:

- 1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or within public access.
- 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
- 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. De-watering:

- 1. Remove all water, including rain water, encountered during trench and substructure work to an approved location by pumps, drains, and other approved methods.
- 2. Keep excavations and site construction area free from water.
- D. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to adjacent areas at all times.

3.03 EXCAVATING

- A. Perform excavating of every type of material encountered within the limits of the Work to the dimensions and elevations indicated and specified herein.
- B. Excavated materials: Transport to, and place in, fill or embankment areas within the limits of the Work; dispose of such excess material away from the site in a location arranged and paid for by the Contractor.
- C. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

D. Unauthorized excavation:

- 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Architect or the Soils Engineer.
- 2. Under footings, foundations, or retaining walls:
 - a. Sub-excavate and recompact earth materials in the affected area as directed by the Soils Engineer.
 - b. When acceptable to the Soils Engineer, lean concrete fill may be used to bring the bottom elevation to proper position.
- 3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the Soils Engineer.

E. Stability of excavations:

1. Slope sides of excavations to 1:1 or flatter, unless otherwise directed by the Soils Engineer.

- 2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.
- 3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

F. Shoring and bracing:

- 1. Provide materials for shoring and bracing as may be necessary for safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
- 2. Maintain shoring and bracing in excavations regardless of the time period excavations will be open.
- 3. Carry shoring and bracing down as excavation progresses.

G. Excavating for structures:

- 1. Conform to elevations and dimensions shown within a tolerance of 0.10 ft.
- 2. Where concrete is anticipated to be placed directly against earth surfaces, widen excavations by one inch at each contact surface beyond that specified on the plans.
- 3. In excavating for footings and foundations, take care to create accurate and straight planes and shapes.
 - a. Excavate by hand tools to final grade where necessary.
 - b. Trim bottoms to required lines and grades to leave solid base to receive concrete.

H. Excavating for pavements:

 Cut surface under pavements to comply with cross-sections, elevations, and grades.

3.04 FILLING AND BACKFILLING

A. General:

- 1. For each classification listed below, place acceptable soil material in layers to required subgrade elevations.
- 2. In excavations, use satisfactory excavated or borrowed material.
- 3. Under asphalt pavements, use subbase materials.

B. Placing and compacting:

- 1. Place backfill and fill materials in layers not more than 8" in loose depth.
- 2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
- 3. Compact each layer to required percentage of maximum density for area.
- 4. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.
- 5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
- 6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.

- C. Backfill excavations as promptly as progress of the Work permits but not until completion of the following:
 - 1. Acceptance of construction below finish grade including, where applicable, damp-proofing and waterproofing.
 - 2. Inspecting, testing, approving, and recording locations of underground utilities.
 - 3. Removing concrete formwork.
 - 4. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
 - 5. Removing trash and debris.
 - 6. Placement of horizontal bracing on horizontally supported walls.

3.05 COMPACTING

- A. Control soil compaction for any areas disturbed during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557. Soils Engineer's recommendations found in the Soils Report will take precedence.
- B. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place, and as approved by the Soils Engineer.
 - 1. Structures: Compact each layer of fill and material or backfill material at 90% of maximum density.
 - 2. Lawn and unpaved areas:
 - 3. Compact the top 8" of subgrade and each layer of fill material or backfill material at 90% of maximum density.
 - 4. Compact the upper 12" of filled areas, or natural soils exposed by excavating, at 85% of maximum density.
 - 5. Paving: Compact each layer of fill material or backfill material at 95% of maximum density.

C. Moisture control:

- Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
- 2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
- 3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests approved by the Soils Engineer.

3.06 FINE GRADING

A. General:

- 1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
- 2. Smooth the finished surfaces within specified tolerance.

- 3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
- B. Grading outside building lines:
 - 1. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
 - 2. Finish the surfaces to be free from irregular surface changes, and:
 - a. Shape the surface of areas scheduled to be under walks to lines, grade, and cross-section, with finished surface not more than 0.10 ft. above or below the required subgrade elevation.
 - b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft. above or below the required subgrade elevation.

3.07 MAINTENANCE

- A. Protection of existing graded areas:
 - 1. Protect existing graded areas from traffic and erosion, and keep free from trash and weeds;
 - 2. Repair and re-establish grades in settled, eroded and rutted areas to the specified tolerances.
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

SECTION 02510

ASPHALT CONCRETE PAVING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work included: Provide base course, asphaltic concrete paving, weed killer, striping and sealer where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. All of the requirements of the Contract Documents apply to this Section.

1.03 QUALITY ASSURANCE

Use adequate number of skilled workman who are thoroughly trained and experienced in the necessary craft and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

1.04 STANDARDS

- A References herein to State Standard Specifications are to the Standard Specifications of the Department of Transportation, State of California (Caltrans), Latest Edition.
- B References herein to Standard Specifications are to the Standard Specifications for Public Works Construction, prepared by the Southern California Chapters of the American Public Works Association and The Associated General Contractors of America, 1995 Edition.

1.05 GUARANTEE

Submit one year guarantee in accordance with and in form required in Division 1. Guarantee shall include bringing to grade and repairing of defective surfacing due to grade settlement of fills, trench fills or any portion of base or surfacing.

1.06 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.07 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's notice to proceed, submit:

- A In accordance with Article 5 of the General Conditions.
- B Materials list of items proposed to be provided under this Section.
- C Certificates, signed by the materials producer and the asphaltic paving subcontractor, stating that materials meet or exceed the specified requirements.

PART 2 -- PRODUCTS

2.01 PAVEMENT SYSTEM

Parking Lots: See Drawings for recommended section.

2.02 AGGREGATES

A. Provide aggregates consisting of crushed stone, gravel, sand, or other sound, durable, mineral materials processed and blended, and naturally combined.

- B. Base aggregate: State Standard Specifications, Section 26, Class 2, maximum size:
 - 1. Base courses over 6 inches: 1-1/2 inch.
 - 2. Other base courses: 3/4 inch.
 - 3. The aggregate base shall also have a sand equivalent value of not less than 30 when tested in conformance with Test Method No. California 217.
- C. Aggregates for asphaltic concrete paving: Standard Specifications Section 203-6, Type I Class C (1/2") for 1-1/2" lifts. Aggregate shall be Type I Class D (3/8") for 1" lifts.
- D. Slurry Seal Aggregate: Standards Specification, Section 203-5.

2.03 ASPHALTS

- A. Asphalt concrete pavement shall comply with Section 203-6 and 302-5 of the Standard Specifications, except that asphalt concrete shall not be placed when the atmospheric temperature is below 50°F. Paving asphalt shall be AR 4000.
- B. Slurry Seal Binder: Standard Specifications, Section 203-5; SS-1H asphaltic emulsion.
- C. Comply with provisions of Standard Specifications, Section 302-5:

1. Asphalt cement:

Penetration grade 50/60

Prime coat:

SC-70 Liquid Asphalt

Tack coat:

Uniformly emulsified, grade SS-1H

2.04 MIXING ASPHALTIC CONCRETE MATERIALS

Provide hot plant mixed asphaltic concrete paving materials in accordance with Standard Specifications, Section 203-6.

- 1. Temperature leaving the plant: 290°F. Minimum, 320°F maximum.
- 2. Temperature at time of placing: 280°F minimum.

2.05 WEED KILLER

- A. Provide a dry, free-flowing, dust-free chemical compound containing not less than 30% sodium chlorate or a chlorpyritos or Permethrin compound, non-flammable, not creating a fire hazard when applied in accordance with the manufacturer's recommendations, soluble in water, and capable of being spread dry or in solution. Chemical shall comply with Section 815-3.6 of FMA MP 5.
- B. Acceptable products:
 - 1. "Duraban TC":
 - "Dragnet":

2.06 HEADERS AND STAKES

Provide Redwood, Construction grade, in dimensions shown on the Drawings or 2×4 sizes for the use where dimensions are not shown on the Drawings.

2.07 MARKING PAINT

Provide traffic paint as indicated on the Drawings and as manufactured by J.E. Bauer Company, in colors selected by the Architect from standard colors of the manufacturer.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 FINAL PREPARATION OF SUBGRADES

- A. After preparation of subgrade as specified in another Section of these Specifications, thoroughly scarify and sprinkle the entire area to be paved, and then compact to a smooth, hard, even surface of 90% compaction to receive the base aggregates or 95% to receive the asphaltic concrete.
- B. Apply the specified weed killer to the entire area to be paved. Adhere to the manufacturer's application recommendations.

3.03 PLACEMENT OF BASE COURSE

A. Base:

- 1. The aggregate base material shall be spread as specified in Section 26-1.035 and 26-1.04 of the State Standard Specifications. The aggregate base material shall be compacted as specified in Section 26-1.05 of the State Standard Specifications.
- Spread the specified base material to a thickness providing 6 inch minimum thickness unless otherwise noted.
- 3. Compact to 95%.
- B. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".
- C. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in ten feet.
 - 1. Deviations: Correct by removing materials, replacing with new materials, and reworking or recompacting as required.
- D. Moisture content: Use only the amount of moisture needed to achieve the specified compaction.

3.04 PLACEMENT OF ASPHALTIC CONCRETE PAVING

- A. The method of depositing, distributing and rolling the asphalt concrete shall be in accordance with Sections 302-5.4 and 302-5.5 of the Standard Specifications.
- B. Install the specified headers and stakes to achieve the arrangement of paving shown on the Drawings.
- C. Remove all loose materials form the compacted base.
- D. Apply the specified prime coat, and tack coat where required, Standard Specification, Sections 302-5.2 and 302-5.3, and allow to dry.
- E. Adjust frames and covers, if so required, to meet final grades.
- F. Receipt of asphaltic concrete materials:
 - 1. Do not accept material unless it is covered with a tarpaulin until unloaded, and unless the material has a temperature of not less than 280°F.

2. Do not commence placement of asphaltic concrete materials when the atmospheric temperature is below 50° F, nor during fog, rain, or other unsuitable conditions.

G. Spreading:

Spread material in manner which requires the least handling.

H. Rolling:

- 1. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.
- 2. Roll in at least two directions until no roller marks are visible.
- 3. Finished paving smoothness tolerance:
 - a. Free from birdbaths.
 - b. No deviations greater than 1/8" in six feet.

3.05 FLOOD TEST

- A. Prior to application of seal coat, perform a flood test in the presence of the Architect.
- B. Method:
 - Flood the entire asphaltic concrete paved area with water by use of a tank truck or hoses.
 - 2. If a depression is found where water ponds to a depth of more than 1/8" in six feet, fill or otherwise correct to provide proper drainage.
 - 3. Feather and smooth the edges of fill so that the joint between fill and original surface is invisible.

3.06 APPLICATION OF SEAL COAT

- A. Prepare the surfaces, mix the seal coat material, and apply in accordance with Standard Specifications, Sections 302-4.
- Apply one coat of the specified sealer.
- C. Achieve a finished surface seal which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

3.07 PAVEMENT MARKING

- A. Prepare the surfaces and apply the specified paint in accordance with the manufacturer's recommendations as accepted by the Architect.
- B. Contractor shall provide two coats as necessary to provide sufficient contrast from paving.

3.08 PROTECTION

Protect the asphaltic concrete paved areas from traffic until the sealer is set and cured and does not pick up under foot or wheeled traffic.

END OF SECTION

SECTION 02550

SITE CONCRETE WORK

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

- A. Complete site concrete work as shown on drawings and specified herein.
 - 1. Final Subgrade Preparation
 - 2. Forms for this Work
 - 3. Placing Concrete
 - Concrete Finishing
 - 5. Concrete Curing
 - 6. Reinforcement

1.03 GENERAL REQUIREMENTS

A. Reference Standards:

- 1. CBC: All work shall conform to the requirements of the 2007 edition.
- 2. County of Riverside.

B. Tests and Inspection:

- 1. Tests shall be performed as required by the Inspector.
- 2. Contractor shall notify testing laboratory a minimum of forty-eight (48) hours before pouring of concrete.
- 3. A minimum of three (3) test cylinders will be taken by molded cylinder method for each fifty (50) yards of each grade of structural concrete. A minimum of one set of cylinders shall be taken for each day placement of each grade.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Contractor shall submit all necessary Product Data and a complete list of material sources for all products to be incorporated into the project for review and approval of the Architect. The Performance of all Mix Designs shall be established either by stamped by an individual licensed to specify concrete mix designs engaged by Concrete Supplier or by break test data from at least 30 different projects for each mix design.

1.06 CLOSEOUT

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

PART 2 -- PRODUCTS

2.01 MANUFACTURER

Materials used in concrete work shall be all new from domestic sources approved by the Architect.

2.02 MATERIALS

- A. Cement: Shall be a standard brand of domestic Portland cement conforming to "Standard Specifications for Portland Cement", ASTM Des. C-150 Type I or II.
- B. Concrete Aggregates: Shall conform to ASTM Des. C-33 and UBC Standard No. 26-2 for stone weight concrete and in addition shall comply with the following:
 - 1. Aggregates shall be from approved local pits and shall not contain opaline, feldspar, siliceous magnesium limestone, or other deleterious substances. No pumice aggregate will be allowed. If aggregate is from pits having a high alkali content, cement shall be "low alkali" with a maximum of 0.6% free alkali as determined by standard tests in ASTM C-114.
 - Concrete aggregates for stone concrete shall conform to UBC Standards, except as modified by this section. Any suitable individual grading of coarse aggregates may be used, provided the "grading of combined aggregates" shown below are obtained. Both the coarse and fine aggregate shall be tested by the use of a solution of sodium or magnesium sulfate, or both, whenever in the judgment of the Architect or Structural Engineer or the Building Department, such tests are necessary to determine the quality of the materials. Such tests shall be performed in accordance with the standard method of tests for "Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate", ASTM C88. The loss shall not exceed six percent for either fine or coarse aggregate. Aggregate failing to comply with this requirement may be used in the work provided it contains less than 2 percent of shale and other deleterious particles and shows a loss in the soundness test of not more than ten (10) percent when tested in the sodium sulphate solution.
 - 3. Grading of Combined Aggregate:

SAME NUMBER ASONE & ONE HALF		ONE INCH	THREE-FOURTHS
SIZE IN INCHESINCH MAXIMUM		MAXIMUM	INCH MAXIMUM
Passing a 2 inch	·	. 	
Passing a 1-1/2"	95 - 100		·
Passing a 1"		75 - 90	90 - 100
Passing a 3/4"	55 - 77	70 - 90	90 - 100
Passing a 3/8"	40 - 35	45 - 65	60 - 80
Passing a No. 4	30 - 40	31 - 47	40 - 60
Passing a No. 8	22 - 35	23 - 40	30 - 45
Passing a No. 16	16 - 30	17 - 35	20 - 35
Passing a No. 30	10 - 20	10 - 23	13 - 23
Passing a No. 50	2 - 8	2 - 10	5 - 15
Passing a No. 100	0 - 3	0 - 3	0 - 5

4. Coarse Aggregate: Shall be clean, hard, fine-grained, sound washed gravel, or crushed stone, containing not more than 2% by weight of flat, thin elongated, friable, or laminated pieces. Maximum sizes of gradations for concrete work shall be 3/4" and 1-1/2" for locations as hereinafter designated. The nominal

maximum size of the aggregate shall not be larger than one-fifth of the narrowest dimensions between sides of forms, one-third of the depth slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars.

- C. Water: For all concrete and cement work shall be clean, free from strong acids, alkali, oil, or organic materials and shall be supplied by Contractor from domestic source.
- D. Form Coatings: Standard product resin type sealer, free of oil, grease, wax or any other substance deleterious to materials applied to concrete, delivered in unopened labeled containers. Do not use form oil or any oil-bearing material.
- E. Forms: Conform to shape, lines and dimensions of the members as shown on the plans. Properly brace or tie together to maintain position and shape. Make forms sufficiently tight to prevent leakage of mortar. Lumber shall be Construction grade Douglas Fir conforming to WCLA Grading Rules 16, as revised.

F. Other Admixtures:

- 1. For workability, an admixture may be added in accordance with manufacturer's recommendations. Obtain approval of material prior to use. Approval will be based on the following requirements:
 - a. Reduction of mixing water by at least ten (10) percent.
 - b. Reduction of segregation and bleeding.
 - c. Increasing of placability and viscosity of concrete.
 - d. No reduction in strength for any proportion of water/cement ration.
- 2. Add air-entrainment material to concrete mix at the rate of 4-6% per cubic yard of concrete.

2.03 CONCRETE

- A. Transmit-mixed concrete shall be mixed and delivered in accordance with the requirements set forth in ASTM C94 and, in addition, shall in no case be mixed for a period of less than ten (10) minutes at a peripheral drum speed of approximately 200 feet per minute, and mixing shall be continued until discharge is completed. At least 3 minutes of the mixing period shall be at the job site. Concrete shall be rejected if not placed in final position within one (1) to one and a half (1-1/2) hours after water is first added to the batch. The concrete at the time of placing shall be in such condition that it can be properly placed.
- B. Site-mixed Concrete: Conform to "Arbitrary Mix" in Uniform Building Code.
- C. All concrete shall be six (6) sack mix concrete having a twenty-eight (28) day strength of not less than two thousand (3000) PSI or as noted on the plans and details.
- D. Curing Materials:
 - 1. Liquid curing compound: Thompson's approved standard product fugitive resin type, or equal conforming to ASTM C309, free of wax or oil, compatible with subsequently applied finishes or coverings, not deleterious to bond of cementitious materials to concrete. Deliver in unopened, labeled containers.
 - 2. Concrete Curing Paper: Sisalkraft, non-staining reinforced type, or equal conforming to ASTM C171.
- E. Expansion Joint Material: "Fleximastic" or other approved hot-pour rubber type conforming to ASTM D1190.
- F. Concrete Finish: Medium Salt Finish and/or broom finish as called out on the Drawings.
- G. Patching Mortar: One part Portland cement or equal (part white and part gray adjusted to match color of paving being patched) and two and one-half (2-1/2) parts sand with the

least water required to produce a workable mass. Rework this mortar until it is the stiffest consistency that will permit placing.

H. Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Company (615) 892-7243, or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 SUBGRADE PREPARATION

- A. Construct the subgrade true to grade and detail as shown on the plans.
- B. Contractor shall verify the acceptability of the work of other sections to be concealed by concrete work prior to commencing concrete placement.
- C. Preparation Before Placing: Water shall be removed from excavation before concrete is deposited. Any flow of water shall be diverted without washing over freshly deposited concrete. Hardened concrete, debris and foreign materials shall be removed from interior of forms and from inner surfaces of mixing and conveying equipment. Reinforcement shall be secured in position, inspected and approved before pouring of concrete. Wheeled concrete-handling equipment shall not be wheeled over reinforcement nor shall runways be supported on reinforcement. Sub-grade for paving over native earth or fill shall be finished to exact location and section of bottom of slab and shall be maintained in a smooth, compacted condition, until concrete is placed. Sub-grade shall be thoroughly moistened but not muddy at time concrete is deposited.
- D. Subgrade to 95% maximum density at optimum moisture content.
- E. Prior to pouring concrete, call Contractor's Soil Engineer for approval of subgrade compaction and moisture content. Give Soil Engineer minimum 24 hours notice prior to inspection time. Soil Engineer's fee will be paid by Contractor.

3.03 FORMING

- A. Set forms with upper edges true to line and grade. Remove side forms not sooner than twelve (12) hours after finishing has been completed.
- B. Form curves so that there are no abrupt offsets or jogs at points of tangency. Secure approval of form alignment both horizontally and vertically prior to pouring and make necessary adjustments to conform to plans and details as directed.
- C. Where forms adjoin existing concrete, the transition shall be smooth and even in both alignment and in horizontal plane.
- D. Forming shall not be secured to surface which will remain exposed, with powder shot studs or any other manner which will damage finish.
- E. Rigidly construct and shore to prevent mortar leakage, sagging, displacement, or bulging between supports. Use clean, sound approved form material, coated with specified materials only, not oil. Provide backing on all plywood joints.

- 1. Form Ties: Bolts or rods with internal ties and spreaders; designed so that no permanent metal is within one (1) inch of exterior surface or one-half (1/2) inch of interior surface.
- Wood: Leave no wood in forms except as indicated nailing blocks and inserts.
- 3. Shores: Of substantial construction to prevent deflection under imposed loads, double-wedged with large bearing blocks, kept tight during concrete placing, or with approved jacks.
- F. Embedded Items: Install work built into concrete such as sleeves, anchor bolts, wood nailers, reglets, frames and sleeves for piping, conduit and fittings. Provide facilities and supervision required for installation of inserts specified under other sections and perform cutting and reinforcing of forms required to accommodate them. Do not place any concrete until all inserted items are installed in their proper locations, secured against displacement, cleaned, inspected and approved. Set such items according to approved shop drawings and setting plans. Furnish ties and supports necessary to keep embedded items in place when concrete is placed.

3.04 CONCRETE INSTALLATION

- A. Construct concrete work to conform to plans and details.
- B. Weather: Do not place concrete during rain unless approved measures are taken to prevent damage to concrete. Cure concrete placed during periods of dry winds, low humidity, high temperatures and other conditions causing rapid drying, initially with a fine fog maintained until final curing operations are begun.
- C. Slump: Conform to ASTM C143. Not over five (5) inches for slabs on grade and not over four (4) inches for walls and footings.
- D. Mix for footings shall be Class B concrete.
- E. Transit Mix:
 - Transit mixed concrete shall conform to ASTM C-94 and UBC Standards. Transit
 mixers shall be equipped with automatic devices for recording number of
 revolutions of drum.
 - 2. Admixture: Shall comply with UBC Standards and shall be installed in accordance with manufacturer's recommendations.
 - 3. Transit mix concrete shall comply with UBC Standards and not be delivered to work with total specified amount of water incorporated therein. Withhold two and a half (2-1/2) gallons of water per cubic yard which may be incorporated in mix before concrete is discharged from mixer truck. Adding of any water shall be under direct inspection of Architect. Each mixer truck shall arrive at job site with its water container full.

3.05 PLACING FORMED CONCRETE

- A. Notify Architect not less than 48 hours before starting any concrete placing. No concrete shall be poured until reinforcing steel and forms have been approved by the Structural Engineer or Architect or by jurisdictional Inspector.
- B. Cleaning of Forms: Before placing of any concrete, thoroughly clean all forms, wash out with water, and make tight.
- C. Concrete: Deliver to point of placing so as not to fall vertically more than six (6) feet, and deposit so that surface is kept horizontal and level, a minimum amount being allowed to flow from one portion to another. Deposit concrete in forms as nearly as possible in its final location. Under no circumstances deposit concrete which has partially hardened.

- D. Vibration and Tamping: As concrete is placed in forms, work concrete around reinforcing steel, built-in items and into corners and angles. Provide mechanical vibrators operated by experienced men for agitating concrete in forms and vibrate thoroughly within five (5) minutes after layer is placed. Vibration shall be carried well into previous layer. Supplement vibration by suitable methods to eliminate voids along forms for full depth of layer as directed. Do not use vibrators to work concrete along the forms. Keep at least one spare vibrator on the job at all times while concrete is being placed. Comply with ACI 309 (609.60), Consolidating of Concrete.
- E. Stoppage: Upon completion of pour and after concrete has partially hardened, wash scum or laitance off surface with stiff brush and stream of water. When work is resumed, brush clean with wire brushes or as specified, then place fresh concrete. A chemical retarding agent may be used on joint surfaces to expose the aggregate. Remove retarded mortar within 24 hours after placing and wash surface to produce a rough, exposed aggregate bonding surface.

3.06 FLATWORK

- A. Set forms as shown on plans.
- B. Deposit concrete evenly, consolidate with mechanical vibrators, particularly at side forms and strike off to indicated elevations and contours. Depress slabs for applied finishes as required. Maintain full indicated thickness of slab over all parts of cambered supports.
- C. Screed concrete to elevations and contour indicated or required for the work. Compact concrete with grid tamper to eliminate voids and pockets and to produce a uniformly dense slab.
- D. Where rough slabs are left to receive deferred finishes, provide protection against contamination from time of placing mechanically, leaving a clean surface.
- E. Expansion Joints:
 - 1. Building/Paving: Three-fourths (3/4) inch expansion joints with one-half (1/2) inch deep poly-sealant caulk water seal. Install typically where concrete paving meets the building shell and columns.
 - 2. Sidewalks: Expansion joints shall be provided in all sidewalks at twenty (20) feet o.c. Joints shall be filled with one-half (1/2) inch asphalt impregnated felt.
 - 3. All exterior flat work shall be marked off as indicated on the Drawings. Make markings with an approved "V" shaped tool, straight, even, properly spaced and uniformly deep matching contraction joints.
- F. Contraction Joints: Locate where indicated on plans, to full depth and slightly below finish surface. Make joints as detailed extending entirely through slab, using material conforming to ASTM D1751. Contraction joints for walks and paving unless otherwise indicated shall be tooled one-fifth (1/5) the depth of the slab and one-eighth (1/8) inch wide. Joints shall be five (5) feet on center unless otherwise indicated on the plans.
- G. Test surface as work progresses and eliminate high or low spots. Smooth gradient transitions are required.
- H. Tolerances: Cement finish shall be true in line, plane and elevations as shown. Finished concrete slab surfaces shall not deviate from a flat plane more than one-eighth (1/8) inch when tested with a ten (10) foot straight edge held in any direction. Furnish and maintain in good condition a ten (10) foot straight edge for use by the Architect.
- I. Defective Finish: Any slab showing a greater variation than the specified one-eighth (1/8) inch, showing voids or separation of the aggregates, or showing a texture in variance to the plans shall be deemed defective and the entire slab shall be removed and replaced with acceptable concrete at the Subcontractor's expense.

3.07 SURFACE FINISHES

- A. Finish all surfaces to present a uniform appearance throughout the area involved, and throughout adjacent areas with the same treatment. Locations of required finish shall be as indicated on plans. Provide two (2) samples of each finish. The approved samples shall act as examples for all concrete work.
- B. Formed surfaces shall be free of flaws, cracks, rock pockets, voids or spalls and be true to line and detail.
- C. Ensure exposed to view finish surfaces of concrete are uniform in color and texture.
- D. Where finishing occurs adjacent to finished metal or other finished surfaces, particularly where serrated or indented, remove all traces of cement film before it hardens. This applies particularly to stair nosings and similar items.
- E. Broomed: After floating, draw broom across the surface at right angle to flow of traffic producing a uniform non-skid surface. For light broom finish, use a fiber broom, leaving depressings approximately one-sixteenth (1/16) inch deep. Use liquid curing membrane.
- F. Medium Salt Finish: After floating, finish with steel trowel. Add salt in density approved in sample. Wash clean after concrete set. Protect landscape areas from salt.
- G. Steel Trowel With "Sack" Finish: Shiner band at joints and paving edges shall be steel troweled. Do not burnish smooth. Sack finish to provide a smooth but skid-proof surface. Use liquid curing membrane.

3.08 CURING

- A. Commence curing as soon as feasible after finishing without marring surfaces, and in any case on same day.
- B. Paper Curing: Except as otherwise specified, use concrete curing paper only, joints sealed with pressure-sensitive tape; immediately repair any tears during curing period. Verify that surfaces remain damp for full curing period; if necessary, lift paper and wet surfaces with clean water, and replace paper.
- C. Liquid Curing Compound: Do not apply on any surface to receive retardant, mortar, or any other material adhered by bond, except as otherwise specified. Carefully mask and protect adjoining surfaces where compound is used.
- D. Fugitive Dye Type: Subject to approval, may be used where no other finish or material is to be applied, ASTM C309, clear, Type 1.
- E. Curing Period and Protection: Maintain curing mediums in proper sealed condition for minimum of ten days after application. Keep traffic on curing surfaces to minimum possible, and completely off liquid compound cured surfaces. Immediately restore any damaged or defective curing media.
- F. Curing Formed Concrete: Keep forms containing concrete thoroughly wet, including tops and exposed portions of concrete, for not less than fourteen (14) days from time of placing concrete. Continuously wet concrete between hours of 8:00 a.m. and sunset each day, including Saturdays, Sundays and holidays, for first ten (10) days, and not less than three (3) times daily for remaining four (4) days. Polyethylene film or equal may be used as approved.

3.09 DEFECTIVE CONCRETE

A. If any concrete work is not formed as indicated, or is not true to intended alignment, or is not plumb or level; or has voids, honeycombs, or has been cut or resurfaced; or has voids or honeycombs that have been filled, unless under the direction of Architect or has any sawdust, shavings, wood or debris embedded in it; or does not fully conform to provisions of contract; then such concrete work shall be deemed to be defective materials and/or

- faulty workmanship and Contractor shall remove same from site in accordance with contract.
- B. Defective concrete will be cut out by Contractor. Patch and fill surfaces which are to remain exposed and indicated to be smooth so as to match adjoining areas.
- C. Fill rock pockets, "honeycombs" and holes resulting from the removal of nails, ties and spreaders and like items with mortar formed of cement and fine aggregate in the proportion used in concrete mix, and non-shrink grout material in quantity as recommended by the manufacturer, using a pressure gun. Chip away defective areas to solid concrete, forming perpendicular or slightly undercut edges. Drench area of patch and surrounding area with water. Brush a thin coat of cement grout onto base and edges of patch area. Pack full with mortar. Match surrounding concrete surfaces in color and texture using part white Portland cement where necessary. Remove fins and irregularities in exposed concrete; patching must match adjoining surface and approved sample.

END OF SECTION

SECTION 02660

SEWER AND WATER MAIN CONSTRUCTION

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

- A. Construct Sewer and Water Mains and appurtenances as shown on the plans to the satisfaction of the Governing Agency.
- B. Contractor shall obtain the needed permits from Special District and shall coordinate all required inspections with Special District and as required by the Owner's Inspector.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions, Project Manual Section 00700.

1.04 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions, Project Manual Section 00700.
- B. Submittal: List of material proposed, accompanied by manufacturers latest printed literature with technical data.
- C. Certificates: Manufacturers certification that materials meet specified requirements.
- D. Certification: Certificate of compliance from testing firm that on-site potable water system is disinfected in accordance with AWWA Standard C601.

1.05 RECORD DRAWINGS

Comply with pertinent provisions of Article of the General Conditions.

1.06 SEQUENCING OF CONSTRUCTION

- A. Protect existing service facilities and other existing utilities in place.
- B. Install site systems as soon as conditions permit other facilities and improvements to follow.
- C. Install tops of manholes, junction chambers, vaults, boxes, valve boxes, etc., unless otherwise specifically indicated on the drawings, to an elevation 3" below rough grade and raise to final elevation after paving.

PART 2 -- PRODUCTS

2.01 MATERIALS

All materials and equipment shall be as specified on the plans or as required by the AWWA specifications and standards.

A. Water lines:

- 1. Piping 2" or smaller than in diameter to be PVC Schedule 40.
- 2. Piping larger than 2" in diameter to be PVC Class 150.
- 3. 14-gauge copper tracer wire to be installed above all mains.

- B. Sewer lines: shall be Schedule 40 ABS pipe per ASTM-F628-91 with solvent weld fittings per ASTM D2661.
- C. Fire Hydrants: Type as specified by the Governing Agency

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 SEWER AND WATER MAIN CONSTRUCTION

The Contractor shall supply all materials, labor, tools and equipment to complete the work to the satisfaction of the Governing Agency.

3.03 FINAL VALVE AND MANHOLE ADJUSTMENT

The Contractor shall adjust the water valves and manholes to grade after Concrete flatwork and final grading has been installed / completed.

END OF SECTION

SECTION 02666

WATER SYSTEM

PART I -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work in This Section: Work includes, but is not limited to:

- 1. Contractor shall furnish and install all piping, valves, fillings, etc. as shown on the plans, as specified herein, and as required to make the on-site water system completely operational.
- Water system From the Utility Company main or point of connection to within 5 feet of the Building or other Building point of connection as indicated on the drawing.
- 3. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications

1.03 QUALITY ASSURANCE

- A. Perform all work in accordance with applicable provisions of "Uniform Plumbing Code", current Edition, International Association of Plumbing and Mechanical Officials, Los Angeles, California (UPC).
- B. Underground Conduit Construction shall be in accordance with Section 306 of "Standard Specifications for Public Works Construction", current Edition, published by Building News, Inc., Los Angeles, California (PWC Specifications).
- C. Disinfection of on-site water system shall be in accordance with American Water Works Associates (AWWA) Standard C601.
- D. Installation of water service line, meter and backflow preventer shall be in accordance with Local Governing Agency requirements.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Submittal: List of material proposed, accompanied by manufacturers latest printed literature with technical data.
- C. Certificates: Manufacturers certification that materials meet specified requirements.
- D. Certification: Certificate of compliance from testing firm that on-site potable water system is disinfected in accordance with AWWA Standard C601.

1.06 RECORD DRAWINGS

Comply with pertinent provisions of Article of the General Conditions.

1.07 SEQUENCING OF CONSTRUCTION

A. Protect existing water service facilities and other existing utilities in place.

- B. Install site water system as soon as conditions permit other facilities and improvements to follow.
- C. Note that work includes the abandonment of existing water system serving the current building, which will remain in service. Sequence construction such that new water service is installed and operational prior to demolishing existing service. Connect existing building to new service, providing a temporary connection where required. Coordinate with and provide assistance to local Utility as required to abandon existing service.
- D. Install tops of manholes, junction chambers, vaults, boxes, valve boxes, etc., unless otherwise specifically indicated on the drawings, to an elevation 3" below rough grade and raise to final elevation after paving.

1.08 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility location. Verify that water system piping may be installed in accordance with original designs and proposed standards.
 - 1. Locate existing water mains and verify any new work to be performed in conjunction therewith. If any pre-existing damage to any portion of the existing water system is discovered, report it in writing to the Owners Representative prior to start of any work connected with or in the area of the damaged portion. Repair or replace any damaged existing water system or portion thereof, which is not reported as described herein, at no additional cost to Owner.
 - Where new water mains connect to existing system, excavate carefully expose and verify horizontal and vertical locations of all points of connection; notify Architect of any discrepancies. Perform all such required exploratory work far enough in advance of storm water main construction to allow for Architect to redesign any systems as required to meet existing condition. No time delays will be allowed due to failure of Contractor to perform this work early enough in his construction period. Any water system that must be reconstructed due to failure of Contractor to verify grades must be completed at no additional cost to the Owner.
- B. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soils Engineer, modify trench backfill connections, materials or methods, all at no additional cost.

PART 2 -- PRODUCTS

2.01 WATER SYSTEMS

- A. Pipe: Poly Vinyl Chloride (PVC)
 - 4" and larger Polyvinyl Chloride (PVC 1120) pressure pipe shall conform to AVMA C-900, DR 18, with elastomeric type gaskets per ASTM F477 in bell-andspigot joints. Pipe shall be UL listed.
 - 2" and smaller PVC shall conform to ASTM D1785, schedule 40. Joints shall conform to ASTM D2564.
- B. Gate Valves (less than 4 inches):
 - 1. Iron body, bronze mounted, parallel seat, double disc, non-rising stem, bottom or side wedging, and comply with AWVVA C-500 specifications.

- 2. Suitable for a working pressure of 150 psi. The working pressure and the name of the manufacturer cast in plain letters on the body of the valve.
- 3. Open by turning counterclockwise.
- 4. Entire wedging mechanism of solid bronze, designed to allow the gates to function property when water pressure is exerted from either or both directions.
- Valve stems shall be solid bronze.
- 6. Stem nuts shall be solid bronze.
- All cast or rolled bronze used in the manufacture of gate valves, which will be in contact with water, shall contain a maximum zinc content of 5 percent and a maximum aluminum content of 2 percent.

C. Gate Valves (4 inches and larger):

- 1. Valves shall be line size, 150 psi working pressure, UL listed, non-rising stem, resilient seat gate valves per AWWA C-509 and shall be opened counter clockwise.
- Valves shall have the manufacturers name, catalog number and marking pressure molded or stamped in places where the name and number may be easily seen when the valves are installed. Valves shall be painted as specified in Section 27, AVVWA Specifications C-500. Valves shall be furnished complete with accessories. Valve joints shall be in accordance with all applicable requirements specified for joints and shall be for buried service.
- D. Check valves: Swing type spring loaded for 150 psi working pressure, set readily and tightly with the face of the closure elements made of a corrosion resistant material such as bronze composition conforming to ASTM B-62.
- E. Backflow Devices: Per Local Governing Agency Standard Specifications.
- F. Meters: Meter shall be furnished by Local Governing Agency and installed by Contractor. Contractor shall schedule and coordinate this work with the Local Governing Agency.
- G. Air / Vacuum Valves and Blowoffs shall be per Local Governing Agency Standards.
- H. Valve Boxes: Unless otherwise specified, the following options may be provided. All valve box covers shall have "WATER" cast in the top using sharp faced letters of 1" minimum height:
 - 1. Cast iron, slip adjustment type of appropriate size for valve. Alhambra No. A-3009 or approved equal.
 - 2. Pre-cast concrete with cast iron cover. For valves larger than 2", Brooks 3-RT series or approved equal. For valves 2" and smaller, Brooks 1-R series (1-RT in traffic areas) or approved equal.
- I. Marker Tape: Manufacturers standard permanent bright blue continuous-printed detectable plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read, "CAUTION WATER LINE BURIED BELOW".
- J. Thrust Blocks: per Local Governing Agency Standards.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.

- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 FIELD CONDITION

- A. Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Correct improper conditions.
- B. Coordinate all work of this section with related trades.
- C. All water used on this project must be delivered through a Water District furnished construction meter or approved alternative. The Contractor shall be responsible for the cost of all construction water: including that used for loading of new lines, testing, flushing, and disinfecting.
- D. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soils Engineer, modify trench/backfill conditions, materials or methods, all at no additional cost.

3.03 TRENCH EXCAVATION, BEDDING, AND BACKFILL

- A. Perform all trench excavation and all additional excavation required for vaults or other structures forming a part of the pipeline. Trench excavation and backfill shall conform to the requirements of Section 02200 of these specifications and Section 306-1.2 of the PWC Specifications and shall require the approval of the Soils Engineer.
- B. For 4" diameter pipe and larger, bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of 30 or more, and have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10

- C. For piping less than 4" in diameter, bedding shall be a granular material free from rocks as approved by the Soils Engineer.
- D. Bedding shall be compacted to 90 percent of the Maximum Relative Density, unless otherwise specified.
- E. In backfilling the trench, take all necessary precautions to protect the pipe from damage due to shifting.
- F. Bury marker tape 6" to 12" below finished grade, directly above pipe.

3.04 PIPE LAYING, JOINTING AND TESTING

- A. Survey line and grade: Provide grade controls and survey lines in accordance, with Section C) 1050.
- B. Pipe installation: the Inspector will inspect Pipe in the field before and after laying. Any corrective work shall be done by the Contractor and approved by the Inspector at no cost to the Owner. Installation of pipe shall conform to the requirements of Section 306.1.2 of the PWC Specifications.

- C. Install concrete thrust blocks against undisturbed soil at all 4" diameter or larger bends, tees, crosses, valves, pipe ends and where changes in pipe diameters occur at reducers or in fittings. Thrust blocks shall be Class 420-C-2500 Portland Cement.
- D. Testing of pipelines: Perform all tests required by governing agencies. Testing shall be performed in accordance with Section 306-1.4 of PWC Specifications. Furnish all water, materials, and labor for making the required tests. All tests shall be made in the presence of the Inspector. Notify the Inspector at least 48 hours before performance of the required tests.
- E. Disinfection: before acceptance of the onsite potable water system, an approved testing firm hired by the Contractor as prescribed in AWWA Standard C601 shall disinfect each unit of completed water line. The disinfection and testing procedures shall continue at the contractors expense until tests indicate that satisfactory bacteriological results have been obtained. The testing firm shall provide a certificate of compliance to the Owner that the unit tested met the AWWA requirements.

3.05 LOCAL GOVERNMENTAL AGENCY

- A. Contractor shall purchase and maintain on the project site copies of the Governing Agencies' Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities, Current Edition. Agency standards shall take precedence over these Specifications.
- B. Prior to final acceptance of the work obtain approval of all connections to the public main and all backflow assembly installations from the Local Governing Water District and submit copies of the Certificates of Completion to the Inspector for forwarding to the Owner.

3.06 DEFECTIVE WORK

Repair or replace defective work as at no additional cost to the Owner.

3.07 CLEAN-UP

Upon completion of work, leave the site clean and clear of debris and construction materials.

*** END OF SECTION ***

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SECTION 02668

FIRE WATER SYSTEMS

PART I -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work in This Section: Work includes, but is not limited to:

- 1. Fire water system with all appurtenances, complete, tested, and ready for service. Contractor shall make "Hot Tap" in accordance with the requirements of "Local Governing Agency" for domestic water systems.
- 2. Contractor shall furnish and install all piping, valves, fittings, etc. as shown on the plans, as specified herein, and as required to make the on-site fire water system completely operational.
- 3. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.

1.03 QUALITY ASSURANCE

- A. Perform all work in accordance with applicable provisions of "Uniform Plumbing Code", current Edition, International Association of Plumbing and Mechanical Officials, Los Angeles, California (UPC), and "standard for the Installation of Private Fire Service Mains and their appurtenances", NFPA 24.
- B. Underground Conduit Construction shall be in accordance with Section 306 of "Standard Specifications for Public Works Construction", current Edition, published by Building News, Inc., Los Angeles, California (PWC Specifications).
- C. Disinfection of on-site water system shall be in accordance with American Water Works Associates (AWWA) Standard C601.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- A. Submittal: List of proposed materials, accompanied by manufacturers latest printed literature with technical data.
- B. Certificates: Manufacturers certification that materials meet specified requirements.

1.06 SEQUENCING OF CONSTRUCTION

- A. Protect existing water service facilities and other existing utilities in place.
- B. Install fire water system as soon as conditions permit other facilities and improvements to follow.
- C. Comply with City Fire Marshall's requirements prior to bringing combustible materials onto construction site.

D. Install tops of manholes, junction chambers, vaults, boxes, valve boxes, etc., unless otherwise specifically indicated on the drawings, to an elevation 3" below rough grade and raise to final elevation after paving.

1.07 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility location. Verify that water system piping may be installed in accordance with original designs and proposed standards.
 - 1. Locate water system piping and verify new work to be performed in conjunction therewith. If any pre-existing damage to any portion of the existing water system is discovered, report it in writing to the Owner's Representative prior to start of any work connected with or in the area of the damaged portion. Repair or replace any damaged existing water system or portion thereof, which is not reported as described herein, at no additional cost to Owner.
 - Where new water mains connect to existing system, excavate, carefully expose and verify horizontal and vertical locations of all points of connection. Notify Architect of any discrepancies. Perform all such required exploratory work far enough in advance of water system construction to allow for Architect to redesign piping required to meet existing conditions. No time delays will be allowed due to failure of Contractor to perform this work early enough in his construction period. Any water system, which must be reconstructed due to failure of Contractor to verify grades, must be completed at no additional cost to Owner.
 - 3. Verify conditions required for connection to exist Rancho California Water District main. If night shutdown of existing main or other special arrangements is required, perform the work at no additional cost to owner.
- B. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soils Engineer, modify trench/backfill conditions, materials, or methods, all at no additional cost.

PART 2 -- PRODUCTS

2.01 WATER SYSTEMS

A. Pipe:

- 1. Polyvinyl Chloride (PVC 1120) pressure pipe shall conform to AWWA C-900; Class 150 (DR 18) with elastomeric-type sealing rings in bell-and-spigot joints. Pipe shall be UL and NSF-61 listed.
- 2. Ductile Iron pipe, AWVVA C-151, with cement mortar lining complying with AV\ANA C-104, Class 51, unless otherwise indicated.
- Concrete cylinder pipe, AWWA C-301.
- 4. Steel pipe, AVVWA C-200, with cement mortar lining and coating, AV\IWA C-205, Type V.

B. Fittings:

- 1. PVC and Ductile Iron Pipe Fittings: AV\IWA C-1 10 or C-153, cement lined with rubber gaskets per AWWA C-111.
- 2. Reinforced Concrete Pipe Fittings: As manufactured for concrete cylinder pipe.

3. Steel Water Pipe Fittings: AVMA C-208; welded joints per AVMA C-206.

C. Valves:

- Line-size gate valves, UL-listed, 175 psi working pressure, resilient wedge gate valve with non-rising stem, unless otherwise specified, with inside screw and shall open to the left or counter clockwise. Valves shall be equipped with double Oring stem seals with both rings located above the collars or with Johns-Manville "Duro" packing, Style No. S-171, or approved equal, cut to fit in separate rings with staggered joints. Valves shall have the manufacturers name, catalog number and marking pressure molded or stamped thereon in places where the name and number may be easily seen when the valves are installed. Valves shall be painted as specified in Section 27, AWWA Specifications C-500. Valves shall be furnished complete with accessories. Valve joints shall be in accordance with all applicable requirements specified for joints and shall be for buried service.
- Valve boxes: Unless otherwise specified, the following options may be provided. All valve box covers shall have "WATER" cast in the top using sharp faced letters of 1" minimum height:
 - a. Cast iron, slip adjustment type of appropriate size for valve. Alhambra or approved equal.
 - b. Pre-cast concrete with cast iron cover. Brooks 3-RT series or approved equal.
- D. Fire Hydrants: James Jones Model J-3765 with (1) 4" and (2) 2-1/2" outlets per Water District requirements.
- E. Air release valves: Per Water District requirements.
- F. Double Check Detector Check Assembly: Per Water District requirements.
- G. Accessories: Provide anchorages for tees, crosses, plugs, and caps, bend valves and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages. Clamps, straps and washers, steel, ASTM A-506; steel rods per ASTM A-575. Rod couplings shall be malleable iron: ASTM A-1 97. Steel bolts per ASTM A-30-1.
- H. Thrust blocks: Per Water District requirements.
- 1. Marker Tape: Manufacturers standard permanent bright blue continuous-printed plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read, "CAUTION WATER LINE BURIED BELOW".

PART 3-- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 FIELD CONDITIONS

- A. Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Correct improper conditions.
- B. Coordinate all work of this section with related trades.

C. All water used on this project must be delivered through a Water District construction meter obtained and paid for by the Contractor, who will be responsible for the cost of all construction water, including that used for loading of new lines, testing, flushing and disinfecting.

3.03 TRENCH EXCAVATION, BEDDING, AND BACKFILL

- A. Perform all trench excavation and all additional excavation required for vaults or other structures forming a part of the pipeline. Trench excavation and backfill shall conform to the requirements of Section 02220 of these specifications and Section 306-1.2 of the PWC Specifications and shall require the approval of the Soils Engineer.
- B. Bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of not less than 30 or have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10
1	

- C. Bedding shall be compacted to 90 percent of the Maximum Relative Density.
- D. In backfilling the trench, take all necessary precautions to protect the pipe from damage due to shifting.
- E. Bury marker tape directly above pipe, 6" to 12" below finished surface of trench backfill.

3.04 CONNECTIONS TO EXISTING MAINS

Connection to existing public main will be per Water District Standard. Contractor shall coordinate this work with the Water District and shall install the service lateral and double check detector check per the water district standards and as shown on contract drawings. All work in public right-of-way shall be in accordance with City Standards. Obtain and pay for encroachment permits from City for all work in City right-of-way.

3.05 PIPE LAYING, JOINTING AND TESTING

- A. Survey line and grade: Provide grade controls and survey lines in accordance with Section 01055.
- B. Pipe installation: the Inspector will inspect Pipe in the field before and after laying. Any corrective work shall be approved by the Inspector at no cost to the Owner. Installation of pipe shall conform to the requirements of Section 306.1.2 of the PWC Specifications.
- C. Install concrete thrust blocks against undisturbed soil, or other restraining devices is detailed, at bends, tees, crosses, valves, pipe ends and where changes in pipe diameters occur at reducers or in fittings.
- D. Flush system in accordance with NFPA 24.
- E. Testing of pipelines: Perform all test required by governing agencies. Testing shall be performed in accordance with Section 306-1.4 of PWC Specifications. Furnish all water, materials, and labor for making the required tests. All tests shall be made in the presence of the Inspector. Notify the Inspector at least 48 hours before performance of the required tests.
- F. Disinfection: Before acceptance of the onsite fire water system, each unit of completed voter line shall be disinfected by an approved testing fin-n hired by the Contractor as

prescribed in AWWA Standard C601. The disinfection and testing procedures shall continue at the contractors expense until tests indicate that satisfactory bacteriological results have been obtained. The testing firm shall provide a certificate of compliance to the Architect that the unit tested met the AWWA requirements.

3.06 DEFECTIVE WORK

Repair or replace defective work no additional cost to the Owner.

3.07 ACCEPTANCE BY LOCAL GOVERNING AGENCY

Prior to final acceptance of the work obtain approval of the double check detector check installation from the governing Water District and submit copies of the Certificates of Completion to the Inspector for forwarding to the Owner.

3.08 CLEAN-UP

Upon completion of work, leave the site clean and dear of debris and construction materials.

*** END OF SECTION ***

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SECTION 02720

SITE DRAINAGE

PART I -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work in This Section: Contractor shall furnish and install site drainage systems as indicated on the drawings and as required to make the system completely operational. Work in this section includes, but is not limited to:

- 1. Furnishing and laying storm drain piping and fittings.
- 2. Bedding
- 3. Drainage, structures
- 4. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications

1.03 QUALITY ASSURANCE

Comply with all requirements of the Governing Agency.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Product Data: Submit manufacturers technical data and installation instructions for the following:
 - 1. Pipe materials.
 - 2. Frames, grates, and covers.
 - 3. Pre-cast concrete drainage structures.
 - 4. Cleanouts and other miscellaneous drainage structures.
- C. Record Drawings: Submit record drawings of installed storm drain system.
- D. If either spiral ribbed or corrugated metal pipe is to be used, submit test results certifying a minimum 50-year service life for the pipe in accordance with the requirements of this section.

1.06 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility location. Verify that storm drain piping may be installed in accordance with original designs and proposed standards.
- B. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. V/here utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soil Engineer, modify trench/backfill conditions, materials or methods, all at no additional cost.

PART 2 -- PRODUCTS

- 2.01 PIPE MATERIALS: Unless a specific pipe option is indicated on the Plans, the following pipe options may be used:
 - A. Reinforced Concrete Pipe (RCP): Conform to ASTM C76 Class III and the applicable provisions of the PWC Specifications.
 - 1. Polyvinyl Chloride (PVC) Plastic Piping:
 - 2. Pipe and Fittings shall conform to ASTM D3034, shall have a Standard Dimension Ratio (SDR) of 35, and shall have ends suitable for elastomeric gasket joints.
 - Joints and Jointing Material: Joints shall conform to ASTM D3212. Gaskets shall conform to ASTM F477.
 - B. Corrugated Metal Pipe (CMP): CMP shall conform to section 207-11 PWC Specifications. It shall have 2-2/3" x 1/2" helical corrugations, with coupling bands of same material as pipe. All pipes shall be fully lined with an asphalt or concrete lining. Coupling bands, bolts and nuts shall be galvanized, t = 0.064".
 - C. Spiral Ribbed Galvanized Steel Pipe: t = 0.064" PWC Specifications, Section 207-11 except for corrugation and fabrication requirements. Ribbed steel pipe shall have a continuous helical rib and a continuous helical lock seam with the rib spaced midway between seams. The rib shall be 3/4" wide by 1" high projecting outward from the surface of the pipe. Rib pitch along the spiral shall not be greater than 11-1/2". The continuous helical lock seam shall be fabricated in accordance with the requirements in Section 207-11.3.3, PWC Specifications. All pipes shall be fully lined with an asphalt or concrete lining. Couplings bands for ribbed steel pipe shall conform to the requirements in Section 207-11.2.2.
 - D. If either spiral ribbed or corrugated metal pipe is to be used, the contractor shall obtain and pay for services of a licensed testing laboratory which shall obtain soil samples from the site and perform chemical and resistivity tests to determine the projected service life of the pipe. The contractor shall submit test results, for Architect's approval, certifying a minimum 50-year service life for the pipe.
 - E. Cast Iron Pipe: Hub and spigot cast iron soil pipe and fittings, ASTM A74 for compression gasket joints. Service Class, extra heavy with gaskets, ASTM C564.

2.02 DRAINAGE STRUCTURES

- A. Concrete for catch basins, culverts and other drainage structures shall be 560-C-3250 or 56G-3-3250, unless otherwise specified.
- B. Forms for concrete drainage structures shall be rigid and substantial. Plywood or tongue and grooved lumber shall be used for forming the exposed faces of all concrete drainage structures.
- C. Pre-cast concrete catch basins: As manufactured by Brooks Products, Inc., or an approved equal.
- D. Planter drains and small-diameter cleanouts (up to 8") shall be cast iron with black paint all exposed surfaces, as detailed. Acceptable manufacturers include Alhambra, Smith, Josam, Wade, and Zurn.

2.03 MISCELLANEOUS

A. Frames and Gates: Conform to the drawings and to the requirements of ASTM A48, Class 3.

B. Marker Tape: Manufacturers standard bright green continuous-printed detectable plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read, "CAUTION-STORM DRAIN BURIED BELOW".

PART 3 - EXECUTION

3.01 EXAMINATION

- Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 BEDDING

- A. Excavate trenches as indicated on the drawings and/or specified elsewhere. Keep trenches clean until installed work has been approved.
- B. Bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of not less than 30 or have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10

C. Bedding shall be compacted to 90 percent of the Maximum Relative Density, unless otherwise specified.

3.03 PIPE INSTALLATION

- A. Install pipe in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated.
- B. Inspect pipe before installation to detect apparent defects. Mark defective materials and promptly remove from site.
- C. Lay bell, hub or groove ends upgrade, accurately centering adjoining spigots in them so as to provide an unbroken continuity of invert.
- D. Install gaskets in accordance with manufacturers recommendations for use of lubricants, cements, and other special installation requirements.
- E. Unless otherwise indicated, lateral connections to main lines and angles in lines shall be made with the use of 45-degree wyes.
- F. Reinforced Concrete Pipe: Lay and bed in accordance with the applicable provisions of the American Concrete Pipe Association's "Concrete Pipe Field Manual", unless otherwise indicated.
- G. Polyvinyl Chloride Pipe: Install in accordance with manufacturers instructions.
- H. Corrugated Metal Pipe or Spiral Ribbed Galvanized Steel Pipe: Install in accordance with manufacturers instructions, unless otherwise indicated.

- I. Unless otherwise shown, match soffits at all storm drain connections, laterals, cleanouts, etc.
- J. Bury marker tape 6" to 12" below finished grade, directly above pipe. Only required on 8" and larger lines.

3.04 DRAINAGE STRUCTURES

- A. Construct catch basins, cleanouts, and other drainage structures at locations, and to the design and dimensions indicated. Exposed concrete work shall have a smooth troweled finish with rounded comers and edges finished plumb and true. Provide grates, frames and covers as required on the plans and specified in this section.
- B. Forms shall be kept in place not less than five days after placing, unless otherwise directed or approved. Concrete mark shall be cured in accordance with Division 3.
- C. Pre-cast concrete catch basins shall be installed to the dimensions and elevations indicated or, the drawings.

3.05 PROTECTION

Drain lines, including trenches, shall be protected from damage during the entire construction period. It shall be the responsibility of the Contractor to replace or remark any damaged portion of the work at his own expense until such time as the project is accepted.

3.06 CLEAN-UP

- A. Upon completion of the work, all storm drain systems shall be left free from silt, debris and obstructions.
- B. Clear dirt and other superfluous material from interior of pipe as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. In large, accessible conduit, brushes and brooms may be used ford cleaning.
- C. Place plugs in ends if uncompleted conduit at end of day, or whenever work stops.
- D. Flush lines clean with water after installation is complete.
- Remove and dispose of existing storm drain facilities as required.

3.07 OPERATIONAL TESTING

- A. Perform all testing required by public agencies having jurisdiction for all or part of the work.
- B. Perform all testing required by these specifications and drawings, to the satisfaction of the Architect.
- C. In addition to other tests, perform the following tests to the satisfaction of the Inspector, and, if requested, the Architect and Owner:
 - 1. Flow-Test roof drain connecting lines with a 3/4" water hose connected to a hose bibb or garden valve; run water at full force for a minimum of 5 minutes. The roof drain receptor and building drain line will be tested in the same manner as the plumbing system.
 - 2. Flow-Test all other drains using the following criteria:
 - a. Flow-test gutters and area drains with a 3/4" water hose connected to a hose bibb or garden valve. Run water for a minimum of 5 minutes.
 - b. Flow-test all catch basins connected to a line 6 inches or larger with a minimum 500gallon deluge of water over a five-minute period.

END OF SECTION

SECTION 02730

SANITARY SEWERS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

- A. Work in This Section: Contractor shall furnish and install all piping, manholes, cleanouts, etc. as shown on the plans, as specified herein, and as required to make the on-site sanitary sewer system completely operational. Work includes, but is not limited to:
 - 1. Sanitary Sewer System to points of connection 5 feet outside of buildings, unless otherwise shown on the plans.
 - Connection to existing systems.
 - 3. Manholes and Cleanouts
 - 4. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications
- B. Related Work Not in This Section:
 - 1. Section 02220: Excavating, Backfilling and Compacting
 - 2. Section 02510: Asphalt Concrete Paving
 - 3. All other utilities, such as Drainage, Water, Gas, Electric, Irrigation, etc.

1.03 QUALITY ASSURANCE

- A. Perform all work in accordance with applicable provisions of "Uniform Plumbing Code", current Edition, International Association of Plumbing and Mechanical Officials, Los Angeles, California. (UPC), and current standards of the local Water District.
- B. Underground Conduit Construction shall be in accordance with Section 306 of "Standard Specifications for Public Works Construction", current Edition, published by Building News, Inc., Los Angeles, California (PWC Specifications).

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- A. Material List: Submit a list of material proposed for use for approval.
- B. Provide written certification that the entire system is clean and free of obstructions.
- Record Drawings: Submit record drawings of installed sanitary sewer system.

PART 2 -- PRODUCTS

2.01 PIPE MATERIALS: Unless a specific pipe option is indicated on the plans, the following options may be used:

- A. Extra strength vitrified day pipe: Conform to ASTM C700. Compression joints shall conform to ASTM C425.
- B. ABS plastic solid wall pipe: Per ASTM D2751 and PWC Specifications, Section 207-15 as modified therein. Joint solvent cement shall be an ABS cement conforming to ASTM D2235. Gaskets shall conform to PWC Specifications, Section 208-4.
- C. Polyvinyl Chloride (PVC) Plastic Sever Pipe: Conform to ASTM D3034, SDR 35. PVC sewer pipe shall have gasketed joints conforming to the requirements of PWC Specifications, Section 208-4.

2.02 CONCRETE MANHOLES

- A. Concrete manholes, unless otherwise specified, shall conform to the specifications referenced on the plans.
- B. Manhole covers shall be marked "SEWER".

2.03 CLEANOUTS

Cleanouts to grade shall be constructed of the same material and same size as associated line; terminate at surface in a concrete or cast iron body with tight-fitting cast iron or brass top. In paved area, top to be traffic-rated; in walks, lawns or planters surface to be smooth, non-tripping. "SEWER" shall be cast into cover in sharp 1" high letters.

2.04 MARKER TAPE

Manufacturers standard permanent bright green, continuous-printed plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read "CAUTION-SEVVER LINE BURIED BELOW".

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 FIELD CONDITIONS

- A. Verify drawing dimensions and elevations with actual field conditions. Inspect related work and adjacent surfaces. Correct all improper conditions.
- B. Coordinate all work of this section with related trades. Immediately notify Architect should conflicts with other utilities be encountered.
- C. Perform all work within the Road right-of-way in accordance with traffic and detour plan approved by the City. Provide all required traffic control devices and personnel. Perform night work if required at no additional cost to Owner.
- D. Verify elevation(s) of point of connection to existing main prior to construction. Where new sanitary sewers connect to existing sewers, excavate carefully, expose and verify horizontal and vertical location of all points of connections. Notify Architect of any discrepancies. Perform all such required exploratory work far enough in advance of sewer construction to allow Architect to redesign sewers as required to meet out-fall conditions. No time delays will be allowed due to failure of Contractor to perform this work early enough in the construction period. Any sanitary sewer, which must be reconstructed due to failure of Contractor to verify grades, must be completed at no additional cost to Owner.

E. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soils Engineer, modify trench/backfill conditions, materials or methods, all at no additional cost to the Owner.

3.03 TRENCH EXCAVATION, BEDDING, AND BACKFILL

- A. Perform all excavation for the construction of trenches and all additional excavation required for manholes or other structures forming a part of the pipeline. Trench excavation and backfill shall conform to the requirements of Section 02220 of these specifications and Section 306-1.2 of the PWC Specifications and shall require the approval of the Soils Engineer.
- B. Bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of the pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of not less than 30 or have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10

- C. Bedding shall be compacted to 90 percent of the Maximum Relative Density.
- D. In backfilling the trench, take all necessary precautions to protect the pipe from damage due to shifting.

3.04 PIPE LAYING, JOINTING AND TESTING

- A. Survey, line and grade: Provide grade controls and survey lines in accordance with Section 01055.
- B. Pipe installation: the Inspector will inspect Pipe in the field before and after laying. Any corrective work shall be done by the Contractor and approved by the Inspector at no cost to the District. Installation of pipe shall conform to the requirements of Sections 306-1.2 of the PWC Specifications.
- Unless otherwise specified, match soffits at all sewer connections, laterals, manholes, etc.
- D. Bury marker tape 6" to 12" below finished grade, directly above pipe.
- E. Testing of pipelines: Perform all tests required by governing agencies. Testing shall be performed in accordance with Section 306-1.4 of PWC Specifications. Furnish all water, materials and labor for making the required tests. All tests shall be made in the presence of the Inspector. Notify the Inspector at least 48 hours before performing the required tests.

3.05 CONNECTIONS TO EXISTING MAINS

Connect on site sewer system to existing system. Comply with all requirements of governing Water District and the City for work within the public right-of-way.

3.06 CLEAN-UP

A. Upon completion of work, all sanitary sewer systems shall be left free from silt, debris, and obstructions.

- B. Clear dirt and other superfluous material from interior of pipe as work progresses. Maintain swab or drag in line and pull past each joint as it is completed.
- C. Place plugs in ends of uncompleted conduit at end of day or whenever work stops.
- D. Flushing of lines: Prior to acceptance of work, flush each line to ensure that the entire system is clean and free of all obstructions.

*** END OF SECTION ***

SECTION 02781

DETECTABLE WARNING SURFACE - PRECAST TACTILE PAVER TILES

PART 1 -- GENERAL

1.01 SUMMARY

Perform all work required to complete, as indicated by the Contract Documents and furnish all supplementary items necessary for the proper installation of Precast Concrete Pavers.

1.02 SYSTEM DESCRIPTION SUMMARY

- A. System shall consist of precast concrete pavers installed on Latex thinset mortar setting hed
- B. The paver installation shall be absolutely rigid and even large slabs when subjected to vehicular traffic, shall not be displaced.

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C 33: Specification for Concrete Aggregates
 - 2. ASTM C 150: Specification for Portland Cement
 - 3. ASTM C 67: Method of Sampling and Testing Brick and Structural Clay Tile
 - 4. ASTM C 140: Specification for concrete
- B. T.C.A. Tile Council of America
 - 1. Installation Method Cement Mortar Bonded F102 95.
- C. A.N.S.I. American National Standards Institute
 - A-118.4 Latex Portland Cement Mortar
 - 2. A-118.6 Grout Latex

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Submit the following in accordance with the Supplementary General Conditions:
 - 1. Manufacturer's Literature: Materials descriptive literature, installation instructions and paver color selection chart.
 - 2. Test Reports: Three (3) copies, showing compliance with specified ASTM requirements
 - 3. Shop drawings (optional):
 - a. Layout drawings of each paved area showing the pattern of pavers, indicate pavers requiring cutting, indicate setting bed methods in each area, drainage patterns and drains. Include details of setting beds, noting all materials and their thickness, show details at curbs and vertical surfaces.
 - Details of custom (nonstandard) curbs and stair tread/risers, include methods of installation

4. Samples: Three (3) sample pavers of each manufacturer, type, size and color selected or specified.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications:

- 1. All products covered under this Section shall be produced by a single manufacturer unless otherwise specified.
- 2. Manufacturer shall submit evidence of having not less than ten (10) years successful production of this product.
- 3. The paver manufacturer shall demonstrate, either by proven field performance of the laboratory freeze-thaw test that the paving units have adequate durability if they are to be subjected to a freeze-thaw environment.
 - a. Satisfactory field performance is indicated when units similar in composition and made with the same manufacturing process as those to be supplied to the purchaser, do not exhibit objectionable deterioration after at least 3 years.
 - b. The units used as the basis for proven field performance shall have been exposed to the same general type of environment, temperature range and traffic volume as is contemplated for the units supplied to the purchaser.

B. Subcontractor Qualifications:

- 1. Subcontractor shall submit evidence of skill and not less than five (5) years specialized experience with this product.
- C. Pre-Installation Conference: As directed by the Architect.

1.07 PROJECT/SITE CONDITION

A. Environmental Requirements: Do no work during freezing weather or on wet or frozen sub-base.

B. Mock-up Installation

- 1. Prior to the start of precast concrete paver work construct mock-ups of each type of paver size and pattern area including precast curb for the Owner and Architect to review. The mock-ups will be at the project site at a location mutually agreed to by the Owner and Contractor.
- 2. Construct the two (2) mock-up installations a minimum 8 foot x 8 foot area of typical precast concrete units and slabs with all setting beds, joints, edge and curb details as shown on the drawings.
- 3. After review of the mock-ups, they should be retained and used as a standard of quality for the precast concrete paver work. At completion of the work remove the mock-up installations and related materials from the project site. If the mock-ups are incorporated in the actual construction, record their actual locations and sizes on the actual built record drawings for the project.

1.08 SEQUENCING AND SCHEDULING

Coordinate sequencing and scheduling of work with other supporting, adjacent, contiguous or otherwise related material trades.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. System Source: Wausau Tile, Wausau WI, 1-800-388-8728
- B. System Name: Thinset Mortar Method Pedestrian Installation
- C. Precast Concrete Pavers
 - 1. Name: Detectable Warning Pavers
 - 2. Size: As shown on the drawings
 - Texture: ADA-2 Truncated Dome
 - Finish and Color: To be picked from Standard color and finish.
 - 5. Reference Standard:
 - a. Cementitious Materials: Materials shall conform to the following applicable ASTM Specifications
 - 1) Portland Cement: ASTM C 150 for Portland Cement
 - b. Aggregates shall conform to these ASTM specifications, except that grading

Requirements shall not necessarily apply:

- 1) Normal Weight: ASTM C 33 for Concrete Aggregates
- c. Other constituents: Coloring pigments, integral water repellents, etc., shall be previously established as suitable for use in concrete and either shall conform to ASTM Standards where applicable, or shall be shown by test or experience not to be detrimental to the durability of the concrete.
- 6. Performance Requirements:
 - a. Compressive Strength: At the time of delivery to the work site, the average compressive strength shall not be less than 7,000 psi with no individual unit less than 6,500 psi per ASTM C 140.
 - b. Absorption: The average shall not be greater than 5% per ASTM C140.
 - c. Flexural Strength: Not less than 600 psi per ASTM 293.
 - d. Load carrying capacity: Paver units shall have a tested center load capacity of 1,750 lbs.
 - e. Latex Mortar Mix: A.N.S.I A-118.4
 - f. Water: Clean and free of deleterious acids, alkalies or organic materials
 - g. Grout: A.N.S.I. A-118.6, Grout Latex
 - h. Sealant: As specified in Section 07900 Caulking and Sealants
 - i. Back-up: As specified in Section 07900 Caulking and Sealants
 - j. Bond Breaker: As specified in Section 07900 Caulking and Sealants

2.02 MIXING

- A. Latex Portland Cement Mortar setting bed: As recommended by the manufacturer.
- B. Grouting Mix: Latex as recommended by manufacturer. Color as selected.
- C. Rework mixes from time to time to maintain proper consistency, as recommended by manufacturer but do not add ingredients. Discard mortar that has reached its initial set.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 INSPECTION

- A. Examine all surfaces to receive the parts of the work specified herein. Concrete slab shall not exceed 1/8" in 10'-0" from required plane. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected. Installation of precast concrete pavers and associated construction constitutes acceptance of the adjacent and underlying construction.
- B. Installation of Mortar bed as per TCA F102 95. All materials used follows instructions of manufacturer for use in mortar method.
- C. Install precast concrete pavers
- D. Grouting of pavers in strict accordance with grout manufacturer's directions and instructions. Latex or acrylic additives of the same manufacturer as the grout.
- E. All control and expansion joints to be installed as per TCA EJ 171-94. All joint materials said to follow manufacturer's directions and instructions.
- F. Field cut precast pavers in accordance with manufacturer's recommendations for methods, equipment and precautions.

3.03 CLEANING AND PROTECTION

- A. Remove and replace pavers that are loose, chipped, broken, stained or other wise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment to eliminate evidence of replacement.
- B. Cleaning: Remove mortar stains and all other types of soiling from exposed paver surfaces, wash and scrub clean.
- C. Provide final protection and maintain conditions in a manner acceptable to installer, which ensures paver work being without damage or deterioration at time of substantial completion.

*** END OF SECTION ***

SECTION 02830

WROUGHT IRON FENCES AND GATES

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work Included: Provide wrought iron fence system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

- Materials list of items proposed to be provided under this Section;
- 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
- 3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
- 4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures for the Work.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Pickets shall be 5/8" square regular style. Pickets shall be spaced at 4" clear unless otherwise shown on the Drawings.
- B. Rails shall be 1" square regular style. This shall also be the size of all members of gate frames up to 25 sq. ft.
- C. Posts:
 - 1. Sizes:
 - a. 1-1/2" square regular weight for end, corner and line posts for fences up to 5'-0" in height.
 - b. 2" square regular weight- end, corner and line posts for 6'-0" high fence and gateposts for regular iron gates up to 15 sq. ft.

- c. 2" square heavy weight for end, corner and line posts up to 6'-0" high and gates between 15 and 25 s. f.
- d. 2-1/2" square for gateposts for iron gates between 25 and 40 sq. ft.
- 2. Provide pressed steel caps with all posts.
- 3. Add 1'-6" to the gross height of the fence for posts going into concrete footings. If posts are designed to be flange mounted, no additional length is required.

D. Finishes:

1. All ornamental steel fencing shall be cleaned in hot caustic solution and coated with an oakite to prevent flash rust and give paint adhesion. After fabrication, panels and posts are to be dipped in black primer coating inside and out of all metal surfaces and then electrostatically sprayed with a finish coat of low sheen, alkalide resin, and zinc chromate rust inhibiting paint.

2.02 HARDWARE

A. Swing Gate Hardware:

- 1. Hinges: Provide clamp-on hardware for flat wall or post installation as shown on the Drawings.
 - a. Operation shall be one- way self-closing butt hinges unless shown otherwise on the Drawings.
 - b. Hinges, which are shown on the drawings to be dual acting, will also be self-closing butt hinges.

2. Latches:

- a. If no other latch / lock is specified, gate manufacturer shall provide padlock hasp at post and gate for securing the gate. Latch shall be a forked or plunger bar to permit operation from either side of the gate.
- 3. Gate pairs shall be provided with drop rod, which shall be accessible only from the interior of the gate and protected by a welded steel box.

B. Rolling Gate Hardware: Provide following for each gate:

- 1. Latches:
 - a. Provide forked type or plunger-bar type to permit operation from either side of the gate.
 - b. Provide padlock eye as integral part of latch.
- 2. Universal Track Bracket:
 - a. Provide 10 gage galvanized steel brackets with 3/8" diameter galvanized
 J-Bolts and nuts.

Rear Wheels:

- a. Provide 5" outside diameter, 4" diameter V-Groove, galvanized steel roller bearing wheel.
- b. Anchor rear wheels to gate frame with 5/8" diameter.
- 4. Double Wheel Carriage:
 - a. Provide 1" x 2" x 14 ga. galvanizing steel tube axle with 3/8" diameter galvanized J-Bolts and 6" diameter rubber tire with galvanized steel roller bearing hub.

PART 3 -- EXECUTION

3.01 EXAMINATION

- Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. General:

- 1. Install posts at a maximum spacing of 8 feet on centers.
- 2. Install corner of slope posts where changes in line or grade exceed a 30° deflection.
- 3. The distance between end or corner posts shall be divided equally into panels not over 8'-0" long.
- 4. Install panels at a bias when there is more than a 4" drop for the distance that the panels in this section cover and more than 2" drop within the length of a given panel. A post shall be installed at the top and bottom of each bias.

B. Excavating:

- 1. Drill holes for post footings in firm, undisturbed or compacted soil, strictly adhering to the dimensions and spacing shown.
- 2. Post hole dimensions:
 - a. Provide 24" deep by 6" diameter foundations for line posts.
 - b. Provide 24" deep by 9" diameter foundations for all other posts. (i.e.: corner and gateposts).
- 3. Spread soil from excavations uniformly adjacent to the fence line, or on adjacent areas of the site if so directed.
- 4. When solid rock is encountered near the surface, drill into rock at least 12" for line posts and at least 18" for end, pull, gate, and corner posts. Drill hole at least 1" greater diameter than the largest dimension of the post to be placed.
- 5. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths as specified above.

C. Setting posts:

- 1. Remove loose and foreign materials from sides and bottoms of holes, and moisten soil prior to placing concrete.
- Center and align posts in hole.
- 3. Place concrete around posts in a continuous pour, and vibrate or tamp for consolidation.
- 4. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
- 5. Trowel tops of footings, and slope or dome to direct water away from posts.
- 6. Extend footings for gateposts to the underside of bottom hinge.
- 7. Set keeps, stops, sleeves, and other accessories into concrete as required.

- 8. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing material or other curing method accepted by the Architect.
- 9. Grout-in those posts, which are set into, sleeved holes, concrete constructions, or rock excavations, using non-shrink Portland cement grout or other grouting material accepted by the Architect.

D. Concrete strength:

- 1. Allow concrete to attain at least 75% of its minimum 28-day strength before rails are installed.
- 2. Do not, in any case, install such items in less than seven days after placement of concrete.
- 3. Do not hang gates until concrete has attained its full design strength.
- E. Rails: Install with panel mounting angle clips with screws into post top and bottom. Ensure each panel is level and plumb. Rails shall be mounted to maintain an even 4" above ground.

F. Installing gates:

- 1. Install gates plumb, level, and secure for full opening without interference.
- 2. Install ground-set items in concrete for anchorage in accordance with the fence manufacturer's recommendations as accepted by the Architect.
- 3. Lubricate and adjust the hardware for smooth operation.

G. Miscellaneous:

1. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as accepted by the Architect.

*** END OF SECTION ***

SECTION 02835

CHAIN LINK FENCES AND GATES

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work Included: Provide chain link fence system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

- A. In accordance with Article 5 of the General Conditions.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's
 Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
 - 4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures for the Work.

PART 2 -- PRODUCTS

2.01 DIMENSIONAL DATA

General:

- 1. Pipe sizes indicated are commercial pipe sizes.
- 2. Tube sizes indicated are nominal outside dimensions.
- 3. H-section sizes indicated are normal flange dimensions.
- Roll-formed section sizes indicated are the nominal outside dimensions.

2.02 GALVANIZING

On steel framework and appurtenances, provide galvanized finish with not less than the following weight of zinc per square feet.

1. Pipe: 1.8 oz., complying with ASTM A120.

- 2. H-sections and square tubing: 2 oz., complying with ASTM A123.
- Hardware and accessories: Comply with Table 1 of ASTM A153.
- 4. Fabric: 2.0 oz., complying with Class II of ASTM A121.

2.03 FABRIC

- A. Provide number 9 gage or 0.148" wires in 2" mesh, with top and bottom salvages twisted and barbed.
- B. Provide fabric in one-piece widths.

2.04 POSTS, RAILS, AND ASSOCIATED ITEMS

A End, corner, slope, and pull posts: Provide at least the following minimum sizes and weights:

Material and dimensions

Lbs. per Lin. Ft.

Pipe, 2.875" outside dimension 5.79

B Line posts: Provide minimum sizes and weights as follows:

Material and dimensions

Lbs. per Lin. Ft.

Pipe, 2.875" outside dimension 3.65

C Gate posts: Provide gate posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:

Material and dimensions

Lbs. per Lin. Ft.

Pipe, 4" outside dimension

9.10

- 1. Over 13 feet wide, and up to 18 feet wide, use 6.625" outside diameter pipe weighing 14.0 lbs. per linear foot.
- Over 18 feet wide, use 8.625" outside diameter pipe weighing 24.70 lbs. per linear ft.

D Top rails:

- 1. Use 1.660" outside diameter pipe weighing 1.80 lbs. per linear foot, or
- Use 1.625" x 1.25" roll-formed sections weighing 1.35 lbs. per linear foot.
- 3. Provide in manufacturer's longest lengths, with expansion type couplings approximately 6" long for each joint.
- 4. Provide means for attaching top rail securely to each gate, corner, pull, slope and end post.

E Post brace assemblies:

- 1. Provide at end and gate posts, and at both sides of corner, slope, and pull posts, with the horizontal brace located at mid-height of the fabric.
- 2. Use 1.660" outside diameter pipe weighing 1.80 lbs. per linear foot for horizontal brace.
- 3. Use 3/8" diameter rod with turnbuckle for diagonal truss.
- F Tension wire: Provide number 7 gage galvanized coiled spring wire at bottom of fabric.

G Post tops:

- 1. Provide single piece steel, wrought iron, or malleable iron, designed as weather-tight closure cap.
- 2. Provide one cap for each post.

3. Provide caps with openings to permit through passage of top rail.

H Stretcher bars:

- 1. Provide one-piece lengths equal to full height of fabric, with a minimum cross-section of 3/16" x 3/4".
- 2. Provide one stretcher bar for each gate and end post, and two for each corner, slope, and pull post, except where fabric is woven integrally into the post.

I Stretcher bar bonds:

- 1. Provide steel, wrought iron, or malleable iron, spaced not over 15" on centers, to secure stretcher bars to end, corner, pull, slope, and gate posts.
- 2. Bands may be used also with special fittings for securing rails to end, corner, pull, slope, and gate posts.

2.05 GATES -- ROLLING

A General:

- 1. Fabricate gate perimeter frames of tubular members.
- 2. Provide additional horizontal and vertical members to assure proper operation of the gate and for attachment of fabric, hardware, and accessories.
- Space so frame members are not more than 8 feet apart.
- 4. Fabricate gate frames from:

Material and dimensions

Lbs. per linear foot.

Pipe, 1.90" outside dimension 2.72

B Fabrication:

- 1. Assemble gate frames by welding with special malleable or pressed steel fittings and rivets for rigid connections.
- Use same fabric as used in the fence.
- 3. Install fabric with stretcher bars at vertical edges as a minimum.
- 4. Attach stretchers to gate frame not more than 15" on centers.
- 5. Attach hardware with rivets or by other means which will provide security against removal and breakage.
- 6. Provide diagonal cross-bracing consisting of 3/8" diameter adjustable length truss rods on gates where required to provide frame rigidity without sag or twist.
- C Rolling Gate Hardware: Provide following for each gate:
 - Latches:
 - a. Provide forked type or plunger-bar type to permit operation from either side of the gate.
 - b. Provide padlock eye as integral part of latch.
 - Universal Track Bracket:
 - a. Provide 10 gage galvanized steel brackets with 3/8" diameter galvanized J-Bolts and nuts.
 - 3. Rear Wheels:
 - a. Provide 5" outside diameter, 4" diameter V-Groove, galvanized steel roller bearing wheel.

- b. Anchor rear wheels to gate frame with 5/8" diameter.
- 4. Double Wheel Carriage:
 - a. Provide 1" x 2" x 14 ga. galvanizing steel tube axle with 3/8" diameter galvanized J-Bolts and 6" diameter rubber tire with galvanized steel roller bearing hub.
- 5. Provide locking device and padlock eyes as an integral part of the latch.

2.06 MISCELLANEOUS MATERIALS AND ACCESSORIES

A Wire ties:

- 1. For tying fabric to line posts, use number 9 gage wire ties spaced 12" on centers.
- 2. For tying fabric to rails and braces, use number 9 gage wire spaced 24" on centers.
- 3. For tying fabric to tension wire, use number 11 gage hog rings spaced 24" on centers.
- 4. Manufacturer's standard wire ties will be acceptable if of equal strength and durability.
- B Concrete: Comply with provisions of Section 03300 for 2500 psi concrete.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A General:

- 1. Install posts at a maximum spacing of 10 feet on centers.
- 2. Install corner of slope posts where changes in line or grade exceed a 30° deflection.

B Excavating:

- 1. Drill holes for post footings in firm, undisturbed or compacted soil, strictly adhering to the dimensions and spacing shown.
- Post hole dimensions:
- 3. Provide 36" deep by 9" diameter foundations for line posts.
- 4. Provide 36" deep by 12" diameter foundations for all other posts.
- 5. Spread soil from excavations uniformly adjacent to the fence line, or on adjacent areas of the site if so directed.
- 6. When solid rock is encountered near the surface, drill into rock at least 12" for line posts and at least 18" for end, pull, gate, and corner posts. Drill hole at least 1" greater diameter than the largest dimension of the post to be placed.

7. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths as specified above.

C Setting posts:

- 1. Remove loose and foreign materials from sides and bottoms of holes, and moisten soil prior to placing concrete.
- Center and align posts in hole.
- Place concrete around posts in a continuous pour, and vibrate or tamp for consolidation.
- 4. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
- 5. Trowel tops of footings, and slope or dome to direct water away from posts.
- 6. Extend footings for gate posts to the underside of bottom hinge.
- 7. Set keeps, stops, sleeves, and other accessories into concrete as required.
- 8. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing material or other curing method accepted by the Architect.
- 9. Grout-in those posts which are set into sleeved holes, concrete constructions, or rock excavations, using non-shrink portland cement grout or other grouting material accepted by the Architect.

D Concrete strength:

- 1. Allow concrete to attain at least 75% of its minimum 28-day strength before rails, tension wires, and/or fabric is installed.
- 2. Do not, in any case, install such items in less than seven days after placement of concrete.
- 3. Do not stretch and tension fabric and wire, and do not hang gates, until concrete has attained its full design strength.

E Rails and bracing:

- 1. Install fence with a top rail and bottom tension wire.
- 2. Install top rails continuously through post caps or extension arms, bending to radius for curved runs.
- 3. Provide expansion couplings as recommended by the fencing manufacturer.
- 4. Provide bracing to the midpoint of the nearest line post or posts at all end, corner, slope, pull, and gate posts.
- 5. Install tension wires parallel to the line of fabric by weaving through the fabric, and tying each post with not less than number 6 gage galvanized wire, or by securing the wire to the fabric.

F Installing fabric:

- 1. Leave approximately 2" between finish grade and bottom salvage.
- 2. Excavate high points in the ground to clear the bottom of the fence.
- 3. Place and compact fill to within 1" of the bottom of the fabric in depressions.
- 4. Pull fabric taut and tie to posts, rails, and tension wires.
- 5. Install fabric on outward side facing side of fence, and anchor to framework so that the fabric remains in tension after pulling force is removed.

6. Install stretcher bars by threading through or clamping to fabric on 4" centers, and secure to posts with bands spaced 15" on centers.

G Installing gates:

- 1. Install gates plumb, level, and secure for full opening without interference.
- 2. Install ground-set items in concrete for anchorage in accordance with the fence manufacturer's recommendations as accepted by the Architect.
- 3. Lubricate and adjust the hardware for smooth operation.

H Miscellaneous:

- 1. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns.
- 2. Bend ends of wire to minimize hazards to persons and clothing.
- Fasteners:
- 4. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
- 5. Peen the ends of bolts to prevent removal of nuts.
- 6. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as accepted by the Architect.

END OF SECTION

SECTION 02874 BICYCLE RACKS AND LOCKERS

PART 1 GENERAL

1.1 Summary

- A. This section includes specifications for the Dero Ultra Space Saver Bike Rack.
 - 1. Modular System One bike per hanger.

1.2 Quality Assurance

- A. Installer Qualifications: An experienced installer who has completed installation of bicycle racks similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.
- B. Manufacturer Qualifications: A firm experienced in manufacturing bicycle racks similar to those required for this project and with a record of successful in-service performance.
- C. Source Limitations: Obtain each color, finish, shape and type of bicycle rack from a single source with resources to provide components of consistent quality in appearance and physical properties.
- D. Product Options: Drawings indicate size, shape and dimensional requirements of bicycle racks and are based on the specific system indicated.

1.3 Submittals

- A. Product Data: Include physical characteristics such as shape, dimensions, bicycle parking capacity and finish for each bicycle rack.
- B. Shop Drawings: Show installation details for each bicycle rack.
- C. Samples for Verification: Submit finish samples for review and verification.
- D. Maintenance Data: For each bicycle rack.
 - 1. Include recommended methods for repairing damage to the finish.

1.4 Delivery, Storage and Handling

- A. Upon delivery, before signing for shipment, inspect for any damages and notate on the B.O.L.
- Store bicycle racks in original undamaged packages and containers until ready for installation
- C. Handle bicycle racks with sufficient care to prevent any scratches or damage to the finish.

1.5 Warranty

A. Bicycle racks carry a one year manufacturer's limited warranty against defects in materials and workmanship. The one year warranty period begins the date the product is shipped from the manufacturer.

PART 2 PRODUCTS

2.1 Acceptable Manufacturers

A. Provide bicycle racks manufactured by DERO BIKE RACK CO., 2657 32nd Avenue S, Minneapolis, MN 55406, 1-800-298-4915. Fax: 612-331-2731 Website: www.dero.com

2.2 Materials

- A. Hanger is 1" OD 11 gauge tube with 3/8" steel round bar.
- B. Upright is 2" x 2" x 3/16" square tube.
- C. Feet are AISI C3 x 4.1 galvanized steel channel.
- D. Crossbeams are 1.25" schedule 40 galvanized pipe (1.660" OD)
- E. Spacers are 2.375" OD plastic tubes with .218" wall thickness.

2.3 Finishes

- A. Finish: body is black TGIC powder-coat (standard). Over 250 high quality TGIC powder-coated colors are available from Dero Bike Rack Co. Hanger rod is black baked-on rubber coating, crossbars are galvanized.
 - 1. Options: a hot-dipped galvanized finish can be special ordered.
 - 2. All powder coat finishes are applied over an electrostatically applied epoxy primer.

2.4 Space Use

- A. Space Use
 - 1. Bikes will hang vertically from the Ultra Space Saver.
 - 2. Each Ultra Space Saver uses 16" of lateral space and 44" of depth/bike.
 - 3. Double sided Ultra Space Savers use 88" of depth per 2 bikes.
 - 4. Allow a minimum of 36" access aisle between occupied Space Savers.
- B. Modular System
 - 1. The Ultra Space Saver is a modular system and can be ordered in any configuration or length.
 - 2. A wall mounted system can be ordered.

PART 3 EXECUTION

3.1 Installation

- 3. Floor mounted: the floor mounted Ultra Space Saver has holes in the feet through which to attach 3/8" x 5" wedge anchors.
- 4. Wall mounted: the wall mounted Ultra Space Savers have two holes through every mounting bracket. Mounting hardware is included.
- 5. All connections and mounting parts have pre-threaded mounting holes (except the feet). No drilling or tapping required.
- 6. It is the responsibility of the installer to ensure that all base materials into which the rack will be installed can support the rack and will not be damaged by any required installation procedures.

END OF SECTION

SECTION 02940

AUTOMATIC IRRIGATION SYSTEM

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

The Contractor shall provide all labor, materials, transportation and services necessary to furnish and install a complete irrigation system as shown on the drawings and specified herein.

1.03 QUALITY ASSURANCE

- A. Conformance: All irrigation work shall conform to applicable local, county and/or state codes, regulations and rules.
- B. License: All work shall be performed by a C-27 California Licensed Landscape Irrigation Contractor.
- C. Permits and Inspections: The Contractor shall obtain, coordinate and pay for any and all permits, fees and agency inspections as required.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

In accordance with Article 5 of the General Conditions.

1.06 INSURANCE

The Contractor shall carry all workmen's compensation, public liability and property damage insurance as required by all applicable codes, regulations and by the Owner.

1.07 SITE VERIFICATION

- A. Field Measurement: Prior to commencement of work, the Contractor shall verify, at the site, all conditions and dimensions shown on the plans necessary to achieve the intended design of the irrigation system. Any discrepancies shall be immediately reported to the Architect.
- B. Liable for Encroachment: The Contractor shall be responsible and liable for any encroachment into adjacent property, rights-of-way, easements, set-backs or any other legal property restrictions either marked or unmarked.
- C. Point of Connection Verification: The Contractor shall verify the static pressure, meter size and size of service to meter (P.O.C.) at each point of connection.
- D. Field Staking: Prior to installation, the Contractor shall locate, by stakes or other means, all pressure supply lines, control equipment, ground cover delineations and heads for approval by the Architect.

1.08 COORDINATION OF ACTIVITIES

The Contractor shall be responsible for coordination of his activities with all other trades.

1.09 INTENDED DESIGN COVERAGE

The Contractor shall be responsible for completion, modification or revisions of the systems as necessary to maintain the consistent coverage design of Contract Documents. Any deviation from the Contract Documents shall have the prior written approval of the Owner and Architect.

1.010 NOTIFICATION OF DISCREPANCIES

- A. Any discrepancies between the field conditions and the Contract Documents and/or the design intent affecting the successful completion and cost of the project shall be reported to the Architect immediately. All work related to the problem area shall cease until the discrepancies have been resolved by the Owner and Architect in writing. Any continuation of work is at the Contractor's risk and expense.
- B. The irrigation plans, including piping and equipment locations, are drawn schematically. The Contractor shall make minor adjustments to the system, as required, to avoid physical elements and conform to the site conditions. In all cases, the Contractor shall insure that there are no conflicts between the irrigation system, planting and construction elements, and existing utilities.

1.011 ELECTRICAL CONNECTION

The Contractor shall be responsible for the final electrical connection from power source to controllers as indicated on the plans, where applicable.

1.012 LIABLE FOR DAMAGE

- A. The Contractor shall be liable for damage to all utilities, construction, irrigation and planting elements, new, marked or unmarked, and shall replace or repair damage to its original condition in a manner acceptable to the Owner.
- B. The Contractor shall be responsible and liable for any loss to his equipment, parts and materials on this project until completion and acceptance of the job in writing from the Owner.

1.013 AS-BUILTS

The Contractor shall provide and keep up to date a complete "As-Built" record set of prints which shall be corrected daily and show every change from the original drawings. Before the time of the final inspection, the Contractor shall transfer all information from the "As-Built" set, and field staking of all equipment located on the mainline and control wire location, to a reproducible drawing or drawings. All work shall be neat and legible. Contractor shall certify reproducibles as to accuracy and completeness.

1.014 WRITTEN GUARANTEE

- A. The Contractor shall guarantee all irrigation material and workmanship for a period of one year following the date of final acceptance of the project. The Contractor shall provide a written guarantee on his letterhead at the time of the final inspection.
- B. The Contractor shall provide a written certification that the irrigation system is installed free from defects in materials and workmanship and in full compliance with the drawings and specifications. This shall be on the Contractor's letterhead with his Irrigation and California C-27 Contractor's License number.

1.015 TURNOVER ITEMS

The Contractor shall supply to the Owner, as part of this contract, the following items prior to the time of the final inspection:

- 1. A reproducible set of "As-Built" drawings as per note above.
- 2. The original of the guarantee letter.
- 3. The original of the certification letter.
- 4. Two keys for each automatic controller.
- Two sets of any special equipment required for operating, adjusting, assembling and removing each type of equipment supplied on this project as requested by the Owner.

1.016 OWNER'S IRRIGATION WORK RESPONSIBILITIES

- A. Construction Responsibilities: The Owner will be responsible for all aspects of construction including all irrigation inspections. All field meetings shall be initiated by the Contractor and coordinated through the Architect for the Owner. The Landscape Architect shall be in a support observation role to the Architect and Owner, providing interpretive advice only in accordance with the observation schedule, as noted.
- B. Determining Legal and Physical Elements: The Owner shall be responsible for determining property lines, rights-of-way, tract boundaries, grades, easements, utility locations (above and below grade) and any other legal or physical elements as required for the successful completion of the work. Contractor shall not be permitted to proceed with any work without determination of the above facts.
- C. Site Discrepancies: All discrepancies in site conditions, drawings or specifications shall be immediately brought to the attention of the Architect. It is the Architect's responsibility to consult the Owner and Landscape Architect prior to any further work in that area. Any unreported discrepancy and continued work without written authorization from the Owner and Architect shall be at the Contractor's risk and expense.
- D. Contract Fulfillment: the Architect and Owner shall decide all questions relating to interpretation of the drawings and specifications, quality of work and acceptable fulfillment of intent of the Contract Document concurrently.

1.017 FIELD OBSERVATION SCHEDULE

- A. Field Observation Coordination: The following observations shall be initiated by the Contractor and coordinated through the Architect. The Contractor shall notify the Architect and Owner not less than forty-eight (48) hours in advance of any requested observation. Continued work without observation at these phases of work is at the Contractor's risk, with any required change or modification at the Contractor's expense. The Architect or Owner shall inform the Landscape Architect as to the purpose and time of the observation forty-eight (48) hours in advance.
- B. Contractor Orientation/Preconstruction Meeting: This meeting shall be conducted to discuss the plans and specifications, possible discrepancies, site conditions and other aspects of the project irrigation work such as scheduling and requirements for starting work. Prior to the meeting, Contractor shall thoroughly acquaint himself with site conditions and the plans, details and specifications.

1.018 CLOSEOUT

- A. The entire sprinkler irrigation system shall be under full automatic operation for a period of seven (7) days prior to the start of any planting.
- B. All irrigation lines, valves and wiring runs shown on plans in the street, paved areas and under hardscaping are schematic. Install these lines, valves and wiring runs in planting areas except where it is obvious that they must cross that paved area to get from one planting area to another or unless noted otherwise.

PART 2 -- PRODUCTS

2.01 SPECIFIED EQUIPMENT

A. All equipment shall be as listed in the legend and installed as per details and specifications, or manufacturer's recommendation. Owner and Architect shall approve any substitutions in writing. Any unapproved equipment shall be replaced at Contractor's expense.

- B. Approval of any item or alternate item indicates only that it apparently meets the requirements of the drawings on the basis of the information submitted, and does not relieve the Contractor of any responsibility for the equipment's successful operation.
- C. Contractor's Guarantee: Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranties will only supplement the guarantee.

2.02 PIPING

- A. Mainline Pipe: Pressure mainline pipe sized two inches (2") and larger shall be PVC Class 315. Pressure mainline pipe 1-1/2" and smaller shall be PVC Schedule 40. Both shall be buried a minimum of 18" and have solvent welded joints made from NSF approved Type I, Grade I PVC compound conforming to ASTM resin specification 1785.
- B. Solvent Welds: PVC solvent weld fittings shall be Schedule 40 1-2, II-K NSF approved, conforming to ASTM test procedure D2466.
- C. Lateral Line Pipe: Non-pressure buried lateral line pipe shall be PVC Class 200, buried a minimum of 12" with solvent weld joints made from NSF approved, Type I, Grade II PVC compound conforming to ASTM resin specifications D1784.
- D. Steel Pipe: Galvanized steel pipe shall be ASA Schedule 40 mild steel screwed pipe with medium galvanized screwed beaded malleable iron fittings.
- E. Steel Pipe Below Grade: All galvanized pipe and fittings installed below grade shall be coated with two (2) coats of Koppers #50 Bitumastic.
- F. Pipe Joints: All connections to be sealed with "Led-Lube" or equal for galvanized joints and "Rector Seal No. 5" or equal for PVC joints.

2.03 CONTROLS

- A. Control Wire: Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire AWG-UF 600 volt UL approved. Minimum size is #14 AWG buried 18" below grade. Use different color pilot wire for each controller. Common wires shall be white with a different color striper for each automatic controller.
- B. Wire Trench: Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible. Where more than one (1) wire is placed in a trench, the wires shall be taped together at intervals not exceeding ten (10) feet.
- C. Expansion Curl: An expansion curl should be provided within three (3) feet of each wire connection and at least every one hundred (100) feet of wire length.
- D. Wire Splices: All splices shall be made with Scotch-Lok #3577 connector sealing packs, pen-tite wire connector, or approved equal. Use one splice per connector sealing pack.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 IRRIGATION MAINLINE AND EQUIPMENT LAYOUT

This observation shall be performed by the Architect following staking of all pressure mainline and control equipment, verification of all site conditions and prior to any trenching. Any discrepancies

not previously noted shall be corrected at this time to the satisfaction of the Owner and Architect at the Contractor's expense.

3.03 IRRIGATION MAINLINE AND PRESSURE TEST

This observation is for the purpose of reviewing all mainline layout for conformance to specifications and verifying the water tightness of pressure systems prior to backfilling trenches. Pressure tests must conform to manufacturer's specifications. All pressure lines shall be tested under a sustained hydrostatic pressure of 150 pounds per square inch for a period of not less than two (2) hours. This test shall be performed in the presence of the Owner's Inspector to manufacturer's accepted testing procedure and approved in writing by the Contractor, prior to backfilling any trenches. Contractor shall furnish necessary force pump and all other necessary testing equipment.

3.04 PROGRESS INSPECTIONS

Periodic inspections shall be performed by Owner's Inspector during the layout of all lateral line systems, with trenches open to verify conformance to details, depth of pipe and equipment assemblies.

3.05 IRRIGATION COMPLETION/COVERAGE TEST

This observation is to ensure conformance of all irrigation equipment with irrigation contract documents and will consist of operation of each system to ensure intended coverage. The Contractor shall flush and adjust all heads for optimum performance and to prevent overspray onto walks, roadways and buildings, etc., prior to this observation. This may include changes in nozzle sizes and degree of arc to optimize operation.

3.06 INSTALLATION

- A. Trenches: Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade.
- B. Backfill: The trenches shall not be backfilled until all required tests are performed. Trenches shall be carefully backfilled with approved materials, free from clods of earth or stones two inches (2") or larger. Backfill shall be mechanically compacted to a dry density equal to adjacent undisturbed soil and shall conform to adjacent surface grades without irregularities.
- C. Streets: Where any cutting or breaking of concrete or other paving surface is necessary, it shall be done and replaced to match existing to the Owner's Inspector satisfaction, by the Contractor, as part of the contract cost.
- D. Pipe Cover: All wire, pressure and non-pressure pipe installed under asphaltic concrete paving shall be installed in Class 315 sleeves, twenty-four inches (24") below road bed and backfilled per structural soils report specifications.
- E. Pipe Clearance: All lines shall have a minimum clearance of six inches (6") from each other. Parallel lines shall not be installed directly over one another.
- F. Control Valves: Install each control valve in a separate locking valve box with a minimum of twelve inches (12") between valves, and a minimum of six inches (6") from any walk or structure.
- G. Head Installation: Irrigation heads shall be installed only after the system has been flushed to the complete satisfaction of the Owner's Inspector. All sprinkler heads shall be set perpendicular to finished grades unless otherwise designated on the plans.
- H. All galvanized pipe on grade shall be secured to slope surfaces at ten feet on center (10' o.c.) and to flat areas at twenty feet on center (20' o.c.) maximum with #4 x 24" rebar with "J" hooked radius at one end to hold pipe securely in place.

END OF SECTION

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SECTION 02950

LANDSCAPE AND PLANTING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

The Contractor shall provide all labor, materials, transportation and services necessary to furnish and install the Landscape Materials as shown on the drawings and specified herein. Items may include, but are not limited to:

- 1. Finish grading and shaping of surfaces to receive planting.
- 2. Soil conditioners for planting areas and backfill mix for trees and shrubs.
- 3. Crushed rock ground cover.
- 4. All plant materials.
- 5. Staking and guying.
- 6. Turf seeding and sodding.
- 7. Pruning of trees and shrubs.
- 8. Maintenance of all planting.
- 9. Guarantee.

1.03 OBSERVATIONS

- A. The Landscape Architect will make the observations. Contractor shall be on the site when observations are made. Request observation by telephone at least two working days in advance of date desired. If the work is not ready for observation when the Landscape Architect arrives, Contractor shall pay for the Landscape Architect's visit.
- B. Observation is required for the following:
 - 1. When grading and soil conditioning has been completed, prior to planting.
 - When trees and shrubs have been spotted for planting, but before planting holes are excavated.
 - 3. When planting and all other specified work has been completed, prior to maintenance period.
 - 4. At end of 90-day maintenance period, if requested.

1.04 GUARANTÉE

- A. All 15 gallon or smaller trees, shrubs and plant material shall be guaranteed for a period of 90 days; 24" box and larger trees shall be guaranteed for a period of one year. All palm trees, regardless of size, shall be guaranteed for one year. All guarantee periods commence from the time of final acceptance by the Owner at the successful completion of the maintenance period.
- B. Replace all dead plants and those not in vigorous conditions noted during the maintenance period, as soon as weather permits.
- C. Plants used for replacements shall be of same kind and size as originally planted. Plants shall be furnished, planted and fertilized as specified and guaranteed.

D. Frost Damage: All plants specified are considered appropriate to the local climate, based on accepted industry standards. It is understood that frosts occur on occasion in this climate, and, as such, will be treated as a no-fault "act of God." If plant material has been delivered to the site, but not planted, the contractor will replace any dead or damaged plant material at no cost to the Owner. If plant material has been planted per these specifications prior to the frost, then the Owner shall be responsible for cost of replacement of frost damaged plant material.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions, Project Manual Section 00700.

1.06 SUBMITTALS

In accordance with Article 5 of the General Conditions, Project Manual Section 00700.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Topsoil:

- Existing soil on the site shall be used as topsoil for planting purposes where
 possible, but shall be free of debris, oil, weeds or other foreign matter.
 Contaminated soil shall be removed and replaced with acceptable existing soil or
 imported soil.
- 2. Imported soil shall be sandy textured. Silt plus clay content of this soil shall not be greater than 15 percent by weight. The boron content of this soil shall not be greater than 1 part per million as measured on the saturation extract. The sodium absorption ration (SAR) shall not exceed 6.0 millimhos per centimeters at 25 degrees Celsius.

B. Fertilizers and Soil Conditioners:

- 1. Organic amendment shall be nitrolized-mineralized redwood sawdust (.5% actual nitrogen) or nitrolized-mineralized fir sawdust (.8% actual nitrogen) or nitrolized-mineralized fir bark (1% actual nitrogen). Amendment shall be fine textured, having actual minimum 80% passing #8 screen and minimum 95% passing #4 screen. The electrical conductivity (EC) should not exceed 3.0. Salinity shall not be higher than 3.5 millimhos per centimeter at 25 degrees C. as measured by saturation extract conductivity.
- 2. Commercial fertilizer shall have a minimum of 12 parts nitrogen, 9 parts phosphoric acid, and 8 parts potash. Deliver mixed fertilizer in standard bags, marked with weight, analysis and name of manufacturer. Keep fertilizer in dry storage.

C. Plant Materials:

- 1. All plant materials shall be healthy, well developed representations of their species or varieties, free from disfigurements, with well developed branch and root systems, conforming to Federal, State and County laws, requiring inspection for plant diseases and insect infestation.
- 2. Inspection certificates required by law shall accompany each shipment, invoice or order for stock, and when plant material arrives at site, file certificate of inspection with Forest Service, or County Agricultural Department.
- 3. Tag plant materials with name and size in accordance with standards of practice recommended by American Association of Nurserymen.

- 4. Sizes of tree and shrub containers shall be as stated on the planting plan. Container stock shall grow in containers for at least 6 months, but not over 2 years. Samples shall be shown to prove that root-bound conditions do not exist. Container plants that have cracked or broken balls of earth when taken from containers, shall not be planted, except upon special approval.
- 5. Do not prune, prior to delivery, except by special approval.
- 6. Plants shall be subject to inspection for size, variety, condition, latent defects and injuries at place of growth and at the project site any time before or during progress of work. Remove rejected plants from the project site immediately and replace with acceptable material.
- 7. Protect all plants from damage by sun, wind or rain at all times before planting.
- 8. If proof is submitted that any plant specified is not obtainable, substitution will be permitted. A proposal will be considered for use of the nearest equivalent in size or variety with an equitable adjustment of contract price. All substitutions will be subject to Landscape Architect's approval.
- 9. Plants shall be grown under climatic conditions comparable to those of the subject site, unless otherwise specifically approved by the Landscape Architect.
- 10. Sod or seed shall be purchased from a reputable company and shall be first quality, fresh and clean. Sod or seed shall be in the proportions specified on plans.
- D. Tree ties shall be of heavy hose-like plastic ties.
- E. Tree stakes shall be 2" diameter x 10'-0" actual dimension for 5 and 15 gallon trees. Use Lodgepole Pine, or approved substituted, pointed at one end and stained over their entire length with green shingle stain. Stake only the plants that are indicated to be staked on Planting Plans. See details on drawings.

F. Root Guards:

 Provide "Deep Root" barrier planter, or equal, where indicated on plan, or as described in this Section. Available from Deep Root Corporation, 81 Langton Street, #4, San Francisco, California 94103 (714) 898-0563. Follow manufacturer's instructions for installation.

G. Crushed Rock Ground Cover:

1. Provide crushed rock (gravel or "fines") where indicated, and as specified, on the drawings. Rock shall be installed per the thickness stated on the drawings: if no thickness is called out install a minimum of 1½" thick. Crushed rock shall be laid over visqueen or a geotextile fabric.

PART 3 -- EXECUTION

3.01 EXAMINATION

- Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Commence work within five days after notification by the Owner and conduct operations continually until completion, unless weather conditions are unfavorable.

- B. Site Clearance: Clean and remove weeds, grasses, roots and any minor accumulated debris and rubbish from planting areas before commencing work. Existence of major amounts of debris shall be called to the attention of the General Contractor for removal.
- C. Storage/Maintenance: Secure permission from the Owner to store plants on the project site. Ensure that they are protected from damage by sun, rain, wind and construction work. Plants stored on site must be watered and maintained so they remain in vigorous condition; damaged material must be replaced at no cost to the Owner.
- D. Finish Grading of Planting Areas: Grading shall be done as indicated on the Grading Plans and as follows:
 - 1. Do not work the soil when moisture content is so great that excessive compaction will occur; nor when content is so dry that dust will form or clods will readily break up.
 - 2. Remove and dispose of all soil in planting areas that contains any deleterious substance such as oil, plaster, concrete, gasoline, paint, solvents, etc., removing the soil to a minimum in the affected areas. The affected soil shall be replaced with native or imported soil, as required. The Subcontractor shall be responsible for any damage to installed plants caused by such substances.
 - 3. If an area to be landscaped is not acceptable to the Contractor, he shall notify the Landscape Architect in writing.
 - 4. Loosen all planting areas to a depth of 8" prior to the start of finish grading. Finish grades shall allow for addition of soil conditioners.
 - 5. Make minor grade adjustments as directed by the Landscape Architect.
 - 6. Warp grades so that water does not collect where designed drainage meets an obstruction.
 - 7. Use water trucks and sprinklers, as required, to control all airborne dust caused by grading operations.
 - 8. Finish grade all planting areas to a smooth and even condition, making certain that water does not pocket nor irregularities remain. Remove and dispose of all foreign materials, clods and rocks over 1-1/2" in diameter within 3 inches of surface. Provide a grade, after conditioning and planting, which is 1-1/2" below the tops of curbs and walks, sloping to drain to adjacent roadway, drain swale or catch basins.
- E. Soil Conditioning: (Applies to all irrigated areas.)
 - Landscape architect will meet with landscape contractor prior to planting in order to discuss plant and tree locations. Landscape contractor must allow for field adjustments of all plant material.
 - Soil samples (one per acre; minimum of one per site) should be sent to Soils and Plant Laboratory, Inc., 1594 North Main Street, Orange, California 92867, (714) 282-8777; or equal approved laboratory. Samples shall be reviewed for soil analysis and amendment recommendations. An analysis shall be submitted to the landscape architect and the Owner in writing. This analysis shall include a location map indicating where the soil samples were taken on the site. This procedure shall also apply to water samples and water analysis should this be necessary. Water analysis shall be done if requested by the landscape architect or the Owner.

The landscape contractor shall provide a minimum of one percolation pit per acre to monitor how quickly the water will drain from tree and shrub pits. Landscape contractor will dig in locations directly by the landscape architect. The holes shall be 48" deep by 48" wide; the holes will then be saturated with water and filled with

- water. The holes will then be measured as to the number of inches they drain in one hour. If the drainage is less than 2" per hour, the contractor must notify the landscape architect in writing. The landscape architect will then provide site-specific drainage details that will assist in removing excess water from tree roots.
- 3. All planting areas with a grade of 3:1 or flatter shall be graded to finish grade allowing for amendments, then incorporate evenly into the top 4" to 6" the following for each 1,000 square feet of area, unless test results require a change; do not add amendments until landscape architect has reviewed test results:
 - a. 3 cubic yards of nitrolized shavings: (1) 200 pounds Gro-power Plus.
 - b. All rocks or unbroken soil clods over 1-1/2" diameter brought to the surface shall be removed from the site.
 - c. Soil deemed to have significant clay content (greater than 15% by weight) shall be amended accordingly prior to planting. (Specifics to be stated on a per project basis). IT IS THE LANDSCAPE CONTRACTORS' RESPONSIBILITY TO DETERMINE CLAY CONTENT OF SOIL AND REPORT TO LANDSCAPE ARCHITECT.
- F. Planting Shall be Done as Follows:
 - 1. Determine location of trees and shrubs by scaling from Planting Plans. All trees planted within 5' of paving, walls or buildings shall have root guards installed, per item F of Section 02950.2.01 of these specifications.
 - 2. Locate containers per plan and obtain approval from the Landscape Architect before excavating pits.
 - Excavate pits per detail sheets.
 - 4. If planting pits are cut with power auger, vertical sides of pit shall be additionally broken with balling bar or spade to interrupt continuous curve influence on root development.
 - 5. Plant material shall be planted in such a manner, that after settling, the crown of the plant bears the same relation to finish grade that it did to the surface in the container.
 - 6. Backfill tree and shrub pits with a prepared mix as follows: (Applies to non-native plant materials only. Native plants to be backfilled with native soil.) This mix may be modified after review of soil sample results.
 - a. 8 parts (by volume) native on-site soil parts (by volume) well composted material or equal.
 - b. 18 lbs of Gro-Power or equal per cubic yard of mix.
 - c. 10 lbs Gypsum per cubic yard of mix.
 - d. Provide Gro-Power Planting Tablets or equal per following schedule:

1 gallon - 3 tablets

5 gallons - 8 tablets

15 gallons - 14 tablets

24" box - 14 tablets

30" box - 15 tablets

- e. Larger per manufacturer's specifications
- 7. Form shallow basin around edge of plant pit.

- 8. Grade area around plants to finish grades and dispose of excess soil.
- 9. Stake or guy all new trees so indicated on plant material legend in accordance with details shown on the drawings.

G. Sodded Turf:

- 1. Irrigate areas to be sodded prior to installation of sod. Soil shall be damp to a depth of 2".
- 2. Lay sod within 2 days after its delivery. Do not leave in rolls in hot sun longer than necessary.
- 3. Unroll sod carefully and place in staggered pattern of strips. Use a piece of 2"x4" board to tamp each roll against the adjacent strips to eliminate joints and edges.
- Trim sod to conform to lawn shapes designated on Planting Plans.
- 5. Irrigate thoroughly to provide good moisture penetration after sod is laid.
- 6. Roll all sod areas with a Ryan Manufacturing Company or equivalent sod roller no later than 2 days after installation. Sod shall be flush with the finish grade of existing sidewalks, curbs, etc. A second rolling will be necessary if the first does not meet with these specifications.
- 7. Do not lay border areas with less than full width sod nor 1/2 length sod. (Sod width 12", length 48")
- 8. Handle and lay sod in a high standard workmanship manner. Fit and join all ends, joints and cuts so there are no voids and the final appearance is one of a continuous lawn.
- 9. Sod area will not be acceptable until approved by the Landscape Architect.

H. Seeded Turf:

- Grass seed shall be a mixture noted herein and evenly sown at the rate of 15 lbs per 1,000 square feet. Exercise care that seed is not distributed other than where it is specified, seed in non-designated areas, which germinates, shall be removed under this contract.
- 2. If seed is not applied by hydro seeding, lightly rake area after seed has been applied and mulch with 1 cubic yard of organic amendment distributed uniformly for each 1,500 square feet. Correct uneven coverage of mulch by means suitable to Landscape Architect.
- 3. Apply water by the site irrigation system. Keep areas moist, but not glistening wet, until the time for the first cutting of grass. Any areas where seeds fail to germinate and grow satisfactorily shall be immediately re-seeded. Dress areas of settlement or erosion with a mixture of 50% fine sand (free from foreign matter, grading not to exceed that of "nursery sand" as supplied by Consolidated Rock) and 50% organic amendment and reseed. Repeat this process until lawn areas are acceptable to the Landscape Architect.
- 4. Mow grass to 1-1/2" minimum when it reaches a 2" height. During the maintenance period, do not allow the grass to exceed 2-1/4" in height. Collect all grass clippings during mowing operations and remove from site.
- 5. Maintain lawn edges adjacent to walks and buildings in a neat condition until the acceptance of the work. If headerboard is not specified, all lawn shapes, as indicated on drawings, shall be achieved by shovel cutting after first moving of lawn.
- 6. Do not allow workmen to walk on lawn areas unnecessarily before, during or after seeding operations. Recultivate and reseed damaged or compacted lawn areas

- at the Contractor's expense.
- 7. Take sufficient measures to prevent damage to lawn resulting from pedestrian traffic. If any type of barrier is used, it shall meet with the approval of the Landscape *Architect. All damage to the lawns must be repaired before acceptance will be given.
- 8. Acceptance of lawn areas will not be made until lawns have received their second mowing and all bare spots have been reseeded and germination has taken place on all reseeded areas. Be responsible for maintenance of lawns until acceptance; this maintenance being part of the installation contract, and bearing no relation to a "maintenance period."

I. Stolonized Turf:

- 1. Irrigate areas to be stolonized to a depth of 2" prior to applying stolons.
- 2. See plans for rate of broadcasting stolons.
- 3. If stolons are not applied by hydro seeding, apply 1 cubic yard of organic amendment distributed uniformly for each 1,500 square feet. Correct uneven coverage of mulch by means suitable to the Landscape Architect or Landscape Contractor.
- 4. Apply water by the site irrigation system. Keep areas moist, but not glistening wet, until the time for the first cutting of grass. Restolonate all areas where stolons fail to germinate and grow satisfactorily. Dress areas of settlement or erosion with a mixture of 50% fine sand (free from foreign matter, grading not to exceed that of "nursery sand" as supplied by Consolidated Rock) and 50% organic amendment and restolonate. Repeat until lawn areas are acceptable to the Landscape Architect or Landscape Contractor.

J. Crushed Rock:

- 1. Sterilize soil.
- 2. Wet and compact area, which is to receive rock to 90% compaction.
- 3. Spread, wet and roll crushed rock to specified thickness. If no thickness is specified provide 2" minimum thickness. Thickness of rock shall be uniform.

K. Pruning:

- 1. Prune minimum necessary to remove injured twigs and branches, deadwood and suckers.
- 2. Prune plants according to standard horticulture practice, by a qualified arborist. Cover all cuts over 1/2" in diameter with an application of "tree seal" or equal, colored to match trunk. Do not use lead base paints.

L. Clean-Up:

- 1. During the course of the work, remove surplus materials from the site and leave premises in a neat and clean condition.
- 2. Clean up and remove all remaining debris and surplus materials upon completion of work, leaving the premises neat and clean.
- 3. Remove all tags, labels, nursery stakes and ties from plants.

3.03 MAINTENANCE

- A. Continuously maintain all areas included in the contract during the progress of the work, the maintenance period and until final acceptance of the work.
- B. After all work indicated on the drawings or herein specified has been completed, observed

and accepted by the Landscape Architect, maintain all planted areas for a period of 90 days.

C. Tree and Shrub Care:

1. Watering: Maintain a large enough water basin around plants so that water can be applied to establish moisture through the major root zone. When hand watering, use a water wand to break the water force.

2. Pruning:

- a. Prune trees to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which have vertical spacing of 18" to 48" and radial orientation so as not to overlay one another. Eliminate narrow v-shaped branch forks that lack strength; to reduce toppling and wind damage by thinning out crowns; to maintain growth within space limitations; to maintain a natural appearance; to balance crown with roots.
- b. Under no circumstances will stripping of lower branches ("raising up") of young trees be permitted. Retain lower branches in a "tipped back" or pinched condition with as much foliage as possible to promote trunk growth (tapered trunk). Lower branches may be cut flush with the trunk only after the tree is able to stand erect without staking or other support.
- c. Thin out and shape evergreen trees when necessary to prevent wind and storm damage. Perform primary pruning to deciduous trees during the dormant season. Prune damaged trees or those that constitute health or safety hazards at any time of the year, as required.
- d. The objectives of shrub pruning are the same as for trees. Do not clip shrubs into balled or boxed forms unless such is required by the design and designated on the plant legend.
- e. Make all pruning cuts of lateral branches or buds, flush with trunk. "Stubbing" will not be permitted.
- 3. Staking and Guying: Remove stakes and guys as soon as they are no longer needed. Inspect stakes and guys to prevent girdling of trunks or branches, and to prevent rubbing that causes bark wounds.

4. Weed Control:

- Keep basins and areas between plants free of weeds. Apply preemergent herbicides recommended by a licensed pest control advisor. Avoid frequent soil cultivation that destroys shallow roots.
- 2. Maintain insect and disease control with approved materials.
- 5. Fertilization: Make three applications of commercial fertilizer 16-6-8 at the rate of 10 lbs/1,000 square foot at the following periods:
 - 1. 30 calendar days after the maintenance period has begun.
 - 2. 60 calendar days after the maintenance period has begun.
 - 3. Just prior to the end of the 90-day maintenance period.
- 6. Replacement of Plants: Remove dead and dying plants and replace with plants of an equal size, condition and variety of original planting plan, to be paid for by the Landscape Contractor.
- 7. Groundcover Care:
 - 1. Apply a pre-emergent, Surflan and Ronstar. Treat larger areas with

- Surflan at rate of 5-1/3 lbs per acre; apply Ronstar to smaller areas at rate of 200 lbs per acre.
- 2. Remove trash weekly.
- 3. Edge groundcover to keep in bounds and trim top growth as necessary to achieve an overall even appearance.
- 4. Replace dead and missing plants at Contractor's expense.
- 5. Exterminate gophers and moles, repair damage.

8. Lawn Care:

- 1. Mow all turf and lawn areas to a minimum height of 3/4" 1" in warm weather and 1-1/2" during the cool season. Mow at least once every 7 days in spring and fall seasons and as needed at other seasons.
- 2. Trim edges at least twice monthly or as needed for a neat appearance. Vacuum or blow clippings off walks.
- 3. Water lawns at such frequency as weather conditions require, in order to replenish soil moisture below root zone. Always water at night. Normally, a total of 1-1/2" of water is needed weekly in hot weather.
- 4. If needed, control broad leaf weeds with selective herbicides. In areas where Crabgrass has infested the lawn, apply pre-emergent herbicides as recommended by a licensed pest control advisor.
- 5. Exterminate gophers and moles and repair damages.
- 6. Overseed as necessary, depending on the season. See plant legend for overseeding requirements.

9. Clean-Up:

- Contractors shall remove all debris associated with his work from the project site on a daily basis. Contractor is responsible for providing proper debris receptacles, or disposing of debris off site.
- b. All receptacles or off site disposal must conform to state and local codes. Contractor is responsible for identifying any waste associated with his work which may be deemed as being "hazardous" as defined by the EPA, and disposing of it per EPA regulations.

*** END OF SECTION ***