CITY OF WHEATLAND

CITY COUNCIL MEETING
STAFF REPORT

April 26, 2022

SUBJECT: Council discussion and consideration to adopt Resolution 15-22 approving plans and specifications for the Spruce Park Improvement Project and authorizing staff to solicit bids.

PREPARED BY: Dane Schilling, City Engineer

Recommendation

Staff recommends your City Council adopt Resolution 15-22.

Background/Discussion

In October 2019, your City Council approved Resolution 38-19 authorizing staff to proceed with park improvement projects to be funded through the Prop 68 Per Capita Program.

After working through project proposals and adjusting to the availability of funds, the final project selected is to complete improvements to Spruce Park. The grant will fund the modifications of Spruce Park to add more appropriate active play elements for teens and age 5-12 users.

The partial renovation of the existing park uses an existing sloped turf area, converting it with grading to provide a halfcourt basketball court, a fun merry-go-round spinner/ climber, along with adding trees, shrubs, picnic tables, and storm water capture to drain the pavement.

The costs for the project are estimated at $213,150 with the State covering $177,952, with the match already budgeted. The project construction documents, recently completed by Melton Design Group, Inc. are fully designed by licensed professionals and ready to be advertised for construction bids. Our goal is to be out to bid this month with award of bid in June and construction in July.

Alternatives

Your Council may choose not to put the project out to bid and not utilize the $177,952 in state grant funding.

Fiscal Impact

There is no budget impact as the match is already in the current year budget.

Attachments

1. Resolution 15-22
2. Plans and Specifications

RESOLUTION NO. 15-22

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF WHEATLAND APPROVING THE PLANS AND SPECIFICATIONS AND AUTHORIZING THE STAFF TO REQUEST FORMAL BIDS FOR SPRUCE PARK RENOVATION PROJECT

WHEREAS, On March 9, 2021 City Council Adopted Resolution 10-21 amending the FY 2021 budget to reflect increased transaction sales tax revenue, set aside $50,000 to meet requirements for a Park Improvement Grant; and

WHEREAS, on December 14, 2021, the City Council of Wheatland adopt Resolution No 42-21 directing City Staff to submit a Prop 68 Rural Recreation and Tourism Grant application to California Department of Parks and Recreation; and

WHEREAS, Melton Design Group was issued a task order to complete the Prop 68 Grant funded design work; and

WHEREAS, Melton Design Group, has provided a bid package for the project entitled "Spruce Park Renovations" consisting of a final set of plans and specifications for approval; and

WHEREAS, the City Engineer has reviewed said plans and specifications for its conformity to City Standards.

NOW, THEREFORE IT IS HEREBY RESOLVED, ORDERED AND FOUND by the City Council of City of Wheatland, State of California, that the proposed Spruce Park Project plans and specifications have been reviewed by the City Engineer, and the plans and specifications are hereby approved, and the City Engineer is hereby authorized to sign said plans and specifications on behalf of the City of Wheatland.

PASSED AND ADOPTED by the City Council of City of Wheatland, State of California this 26th day of April 2022, by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

_____
Rick West, Mayor

ATTEST:

Lisa Thomason, City Clerk

LANDSCAPE PLANS FOR THE CONSTRUCTION OF:

SPRUCE PARK RENOVATION

MCDEVITT DRIVE AND SPRUCE AVENUE
WHEATLAND, CA 95692

PREPARED FOR:

CITY OF WHEATLAND
111 C STREET
WHEATLAND, CA 95692

PREPARED BY:

MELTON DESIGN GROUP

CHICO
820 BROADWAY ST.
CHICO, CA 95928
(530) 899-1616

SACRAMENTO
1930 G STREET
SACRAMENTO, CA 95811
(916) 754-2153

INDEX OF SHEETS

SHEET	TITLE
L0.0	TITLE SHEET
L1.0	EROSION CONTROL AND DEMOLITION PLAN
L2.0	CONSTRUCTION PLAN
L2.1	CONSTRUCTION DETAILS
L2.2	GRADING PLAN
L3.0	PLANTING PLAN AND DETAILS
L4.0	IRRIGATION PLAN
L4.1	IRRIGATION DETAILS

GENERAL CONSTRUCTION NOTE:

CONSTRUCTION UNDER THIS CONTRACT SHALL COMPLY WITH THE LATEST CALIFORNIA BUILDING CODE (CBC), CALIFORNIA MECHANICAL CODE (CMC), CALIFORNIA PUBLIC CODE (CPC), CALIFORNIA ELECTRICAL CODE (CEC), AND THE 2019 CALIFORNIA ENERGY STANDARDS AS AMENDED BY THE STATE OF CALIFORNIA AND THE LOCAL JURISDICTION.

PREPARED BY OR UNDER THE SUPERVISION OF:

______________________ DATE ________
GREG MELTON
RLA No. 4217

NOTE TO CONTRACTOR:

AUTOCAD FILE TO BE PROVIDED TO CONTRACTOR FOR USE BY CONTRACTOR TO STAKE OUT SITE ELEMENTS

ACCEPTED BY:

______________________ DATE ________
JIM GOODWIN, WHEATLAND CITY MANAGER

KEY MAP OF YUBA COUNTY

LANDSCAPE DOCUMENTATION PACKAGE (LDP) CHECKLIST

CHECK BOX	DESCRIPTION	CHECK BOX	DESCRIPTION
☐	DATE:	☐	"I AGREE TO COMPLY WITH THE REQUIREMENTS OF THE WATER EFFICIENT LANDSCAPE ORDINANCE AND SUBMIT A COMPLETE LANDSCAPE DOCUMENTATION PACKAGE INCLUDING UPDATED IRRIGATION SCHEDULE AND USE CALCULATION."
☐	PROJECT APPLICANT: (CONTRACTOR)		
☐	PROJECT ADDRESS: MCDEVITT DRIVE AND SPRUCE AVENUE WHEATLAND, CA 95692 YUBA COUNTY APN: 015-752-002		APPLICANT SIGNATURE (CONTRACTOR)
☐	TOTAL LANDSCAPE AREA (IN SQUARE FEET): 8,805 SF (MAJORITY RETROFIT)	☐	MAINLINE PRESSURE TEST AND TRENCH REVIEW
☐	PROJECT TYPE (LANDSCAPE CONSTRUCTION-PARK)		
☐	WATER SUPPLY TYPE AND NAME OF LOCAL WATER PURVEYOR: CITY OF WHEATLAND (530) 633-2761		
☐	CHECKLIST OF ALL DOCUMENTS IN THE LDP	☐	SOILS MANAGEMENT REPORT: TO BE PROVIDED BY CONTRACTOR
☐	CONTACT INFORMATION FOR THE APPLICANT AND PROPERTY OWNER: APPLICANT (CONTRACTOR): PROPERTY OWNER: CITY OF WHEATLAND 111 C STREET WHEATLAND, CA 95692	☐	CONSTRUCTION DESIGN PLAN: SHEET L-2.0
		☐	LANDSCAPE DESIGN PLAN: SHEET L-3.0
		☐	IRRIGATION DESIGN PLAN: SHEET L-4.0
		☐	GRADING DESIGN PLAN: SHEET L-2.2

LANDSCAPE CONSTRUCTION APPROVAL CHECKLIST

CHECK BOX	DESCRIPTION	CHECK BOX	DESCRIPTION
☐	MATERIAL SUBMITTAL PACKAGE	☐	VERIFY CONNECTION TO CONTROL SYSTEM
☐	TOP SOIL OR AMENDMENT RECOMMENDATION (#1 SOIL REPORT & RECOMMENDATION)	☐	COMPLETED IRRIGATION AUDIT
☐	WATER METER LOCATION POINT OF CONNECTION	☐	FINAL WALK THROUGH 60 DAY MAINTENANCE PERIOD
☐	ELECTRICAL POINT OF CONNECTION (CONTRACTOR TO COORDINATE)		START ________ FINISH ________
☐	TELEPHONE POINT OF CONNECTION (CONTRACTOR TO COORDINATE)	☐	AS - BUILTS (HARD COPY AND DIGITAL) CONTROLLER CHART (LAMINATED)
☐	GRADING AND GROUND PREPARATION SOIL REPLACEMENT	☐	NOTIFICATION OF MAINTENANCE RESPONSIBILITY TO CITY
☐	MAINLINE PRESSURE TEST AND TRENCH REVIEW	☐	CERTIFICATE OF COMPLETION (BY LANDSCAPE ARCHITECT)
☐	IRRIGATION OPERATION, COVERAGE TEST (PRIOR TO PLANTING, MULCH OR SURFACE MATERIAL)	☐	1 YEAR ACCEPTANCE OF PLANT WARRANTY PERIOD: DATE TO BE 1 YEAR AFTER APPROVAL OF 60 DAY MAINTENANCE PERIOD: ____
☐	PLANT INSPECTION AND LOCATION (BY LANDSCAPE ARCHITECT)		
	CONTRACTOR SIGNATURE: ______________ DATE ________		NOTE: THIS LIST OF REQUIRED SUBMITTALS AND INSPECTIONS IS FOR REFERENCE PURPOSES ONLY. SEE SHEET FORM SPECIFICATIONS AND DETAILS FOR COMPLETE SUBMITTAL AND INSPECTION REQUIREMENTS.

PROJECT LOCATION WHEATLAND CA

CALL BEFORE YOU DIG

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Call: 530-633-2761

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Call: TOLL FREE 1-800-227-2600
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820 BROADWAY ST.
CHICO, CA 95928
(530) 899-1616
meltondg.com

LICENSE

CONSULTANT

CLIENT
CITY OF WHEATLAND

PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
TITLE SHEET

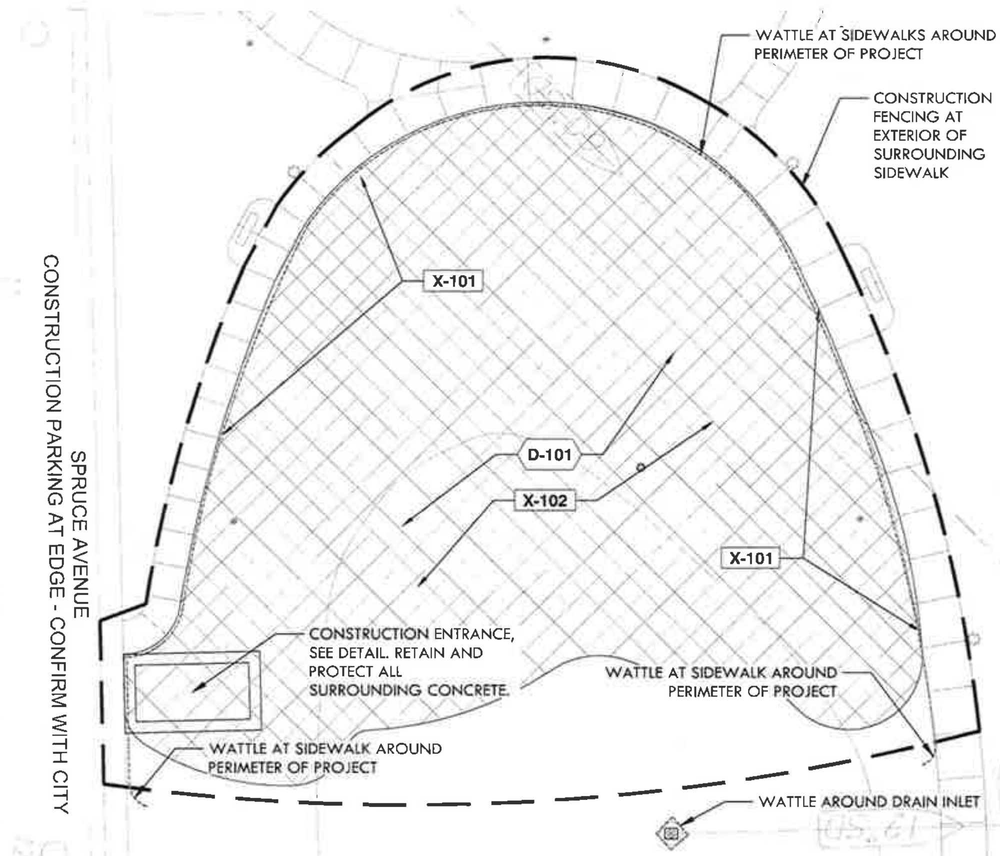
DATES

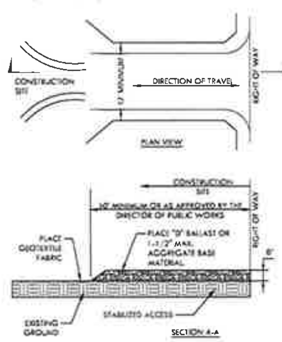
NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Park Rename	2022-03-15
5.	--	--
6.	--	--
7.	--	--
8.	--	--

PLOT DATE: --

PROJECT NUMBERS
MELTON DESIGN GROUP: 3x36-x
TASK ORDER
CONSULTANT PROJECT #: --

SHEET NUMBER
L0.0
SHEET 1 OF 8

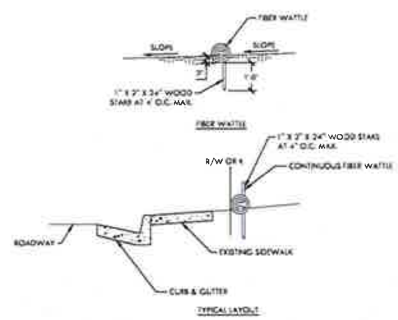




NOTES:

1. STABILIZED CONSTRUCTION SITE ACCESS SHALL BE CONSTRUCTED OF 1-1/2" MAXIMUM AGGREGATE BASE MATERIAL CONFORMING TO SECTION 26 OF STATE SPECIFICATIONS. MATERIAL SHALL BE PLACED TO A MINIMUM THICKNESS OF SIX INCHES. THE METHOD OF PLACING, SPREADING AND COMPACTING AGGREGATE BASE MATERIAL SHALL CONFORM TO SECTION 26 OF THE STATE SPECIFICATIONS.
2. LENGTH OF SITE ACCESS SHALL BE A MINIMUM LENGTH OF FIFTY FEET. WIDTH SHALL BE A MINIMUM OF TWENTY FEET, OR GREATER AS NECESSARY TO COVER ALL VEHICULAR INGRESS AND EGRESS.
3. THE SITE ACCESS SHALL BE KEPT IN GOOD CONDITION BY OCCASIONAL TOP DRESSING WITH AGGREGATE BASE MATERIAL OR CLEANED AS DIRECTED BY THE PROJECT SUPERVISOR.
4. TRUCK TIRES SHALL BE WASHED DOWN AND THE SEDIMENT CONTAINED ON THE PROJECT SITE.

1 / L1.0 — TEMPORARY CONSTRUCTION SITE ACCESS
N.T.S.



2 / L1.0 — FIBER WATTLE LAYOUT
1/2" = 1'-0"

DEMOLITION SCHEDULE

SYMBOL	DEMOLITION DESCRIPTION
D-101	REMOVE TURF, CLEAR, AND GRUB TO PREPARE FOR NEW CONSTRUCTION AND PLANTING, INCLUDING RE-SOD.

EXISTING CONDITIONS SCHEDULE

SYMBOL	EXISTING CONDITIONS DESCRIPTION
X-101	PROTECT AND RETAIN ALL (E) CONCRETE. REPLACE ANY DAMAGE THAT OCCURS THROUGHOUT COURSE OF PROJECT.
X-102	RETAIN IRRIGATION FOR MODIFICATION TO ACCOMMODATE NEW PLANTING.

DEMOLITION/LEGEND NOTES

1. CONFIRM ALL LOCATIONS OF EXISTING UTILITIES WITHIN PROJECT SITE PRIOR TO EXCAVATION. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND REPAIR OF DAMAGE TO ALL EXISTING UTILITIES, HARDSCAPE, PLANTING, FENCING, SIDEWALKS, CURBS, GUTTERS, ETC. THAT ARE TO BE RETAINED.
2. INSTALL ALL ELEMENTS PER MANUFACTURERS' SPECIFICATIONS.
3. CONTRACTOR IS RESPONSIBLE TO COORDINATE HIS WORK WITH THE WORK OF OTHERS.
4. CONTRACTOR SHALL OBSERVE ALL SAFETY REGULATIONS PERTAINING TO THIS PROJECT.
5. ANY CHANGES SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AND MANUFACTURER REPRESENTATIVE PRIOR TO CONSTRUCTION.
6. ALL VEGETATION, TOP SOIL AND OTHER UNSUITABLE MATERIAL IN AREAS OF FOUNDATIONS AND CONCRETE SLABS SHALL BE REMOVED FROM CONSTRUCTION AREA.
7. SEE DETAILS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
8. AUTO CAD FILE AVAILABLE FROM LANDSCAPE ARCHITECT FOR CONSTRUCTION LAYOUT AND STAKING PURPOSES. (530) 899-1616

EROSION CONTROL GENERAL NOTES

1. EROSION CONTROL DEVICES TO BE IN PLACE BEFORE START OF CONSTRUCTION.
2. CONTRACTOR SHALL PLACE STABILIZED CONSTRUCTION SITE ACCESS PER DETAIL THIS SHEET.
3. CONTRACTOR STORM WATER POLLUTION PLAN SHALL BE AVAILABLE ON SITE AT ALL TIMES.
4. CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR STATE WATER RESOURCES CONTROL BOARD.
5. SWPPP TO BE IN IN PLACE BEFORE START OF CONSTRUCTION.
6. CONTRACTOR SHALL PROVIDE STRAW WATTLE AT BACK OF CURB OR BANK AND IN AREAS REQUIRED BY THIS EROSION CONTROL PLAN.
   - 6.1 INSPECTION BY CONTRACTOR SHALL BE FREQUENT. REPAIRS AND/OR REPLACEMENT SHALL BE MADE PROMPTLY, AS REQUIRED.
   - 6.2 ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF NINE INCHES.
7. INTERIM EROSION CONTROL MEASURES MAY BE NEEDED AND SHALL BE INSTALLED DURING CONSTRUCTION TO ASSURE ADEQUATE EROSION CONTROL FACILITIES ARE IN PLACE AT ALL TIMES.
8. AFTER THE HARDSCAPES ARE COMPLETED GRAVEL BAGS, FILTER FABRIC AND DRAIN ROCK SHALL BE PLACED AROUND EACH DROP INLET.
9. CONTRACTOR SHALL USE DUST CONTROL MEASURES IN THE FORM OF WATER APPLICATION TO ALL EXPOSED SOIL SURFACES TO PREVENT THE TRANSPORT OF SOIL FROM EXPOSED SURFACES ON CONSTRUCTION SITES IN THE FORM OF AIRBORNE PARTICULATES. WATERING OF EXPOSED SOIL SURFACES SHALL OCCUR AT LEAST TWICE DAILY, PREFERABLY IN THE LATE MORNING AND AFTER WORK IS DONE FOR THE DAY. ALL CLEARING, GRADING, EARTH MOVING OR EXCAVATION ACTIVITIES SHALL CEASE WHEN WINDS EXCEED 15 MPH AVERAGED OVER 1 HOUR.
10. ANY SOIL MATERIAL CARRIED ONTO STREET SURFACES BY CONSTRUCTION EQUIPMENT SHALL BE REMOVED ON A DAILY BASIS. (BROOM CLEAN- DO NOT USE WATER TO WASH THE STREET)
11. HAUL TRUCKS SHALL BE COVERED WITH TARPAULINS OR OTHER EFFECTIVE COVERS AT ALL TIMES.
12. PRIOR TO PLACEMENT OF LANDSCAPING, REMOVE TEMPORARY EROSION CONTROL MEASURES (STRAW WATTLES).
13. STOCKPILES NOT USED WITHIN THE LAST 14 DAYS MUST BE COVERED WITH AN EROSION CONTROL BLANKET OR PLASTIC SHEETING AND CONTAINED WITH A FIBER ROLL OR GRAVEL BAG BERM.

EROSION CONTROL NOTES

1. CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR LOCAL AGENCY AND STATE WATER RESOURCES CONTROL BOARD REQUIREMENTS AND CREATING STORMWATER POLLUTION PREVENTION PLAN.
2. CONTRACTOR SHALL MAINTAIN ALL STRAW WATTLES/SILT FENCES AND OTHER STORM WATER POLLUTION PREVENTION DEVICES THROUGHOUT CONSTRUCTION SILT BUILDUP IN SILTING BASIN AREA SHALL BE REMOVED AS NECESSARY. REMOVE ALL BALES AND POLLUTION PREVENTION DEVICES AT THE END OF CONSTRUCTION.
3. CONTRACTOR STORM WATER POLLUTION PLAN SHALL BE AVAILABLE ON-SITE AT ALL TIMES.
4. CONTRACTOR SHALL VERIFY LOCATIONS WITH CITY REPRESENTATIVE AND ENSURE STABILIZED CONSTRUCTION SITE ACCESS.
5. WATTLES MAY BE USED IN-LIEU OF STRAW BAILS, IF ADEQUATELY HOLDING BASE SILT.
6. SWPPP TO BE IN PLACE BEFORE START OF CONSTRUCTION IF REQUIRED.

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
— —	CONSTRUCTION FENCING AT LIMIT OF WORK	-
- - - - - -	STRAW WATTLE	SEE DETAIL 1, SHEET L1.0
☐	DRAIN INLET FILTER	SEE DETAIL 2, SHEET L1.0

CONSTRUCTION ACCESS NOTE:

1. CONSTRUCTION ENTRY, TRACK OUT, AND CONCRETE WASHOUT AREA LOCATIONS TO BE LOCATED BY CONTRACTOR ALONG SPRUCE AVENUE. FINAL LOCATION PENDING APPROVAL BY OWNER.

NORTH
0 10 20
SCALE: 1" = 10'

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LICENSE

CONSULTANT

CLIENT
CITY OF WHEATLAND

PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
EROSION CONTROL AND DEMO PLAN

DATES

NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Park Rename	2022-03-15
5.	-	-
6.	-	-
7.	-	-
8.	-	-

PLOT DATE: -

PROJECT NUMBERS
MELTON DESIGN GROUP: 2436.4
TASK ORDER
CONSULTANT PROJECT #: -

SHEET NUMBER
L1.0
SHEET 2 OF 8

CONSTRUCTION SCHEDULE

SYMBOL	DESCRIPTION	DETAIL
1	CONCRETE PICNIC TABLES. CONTRACTOR TO INSTALL PER MANUFACTURER'S INSTRUCTIONS. MANUFACTURER: OUTDOOR CREATIONS. MODEL: 1085. CONCRETE COLOR: DAVIS DARK GREY. AVAILABLE FROM OUTDOOR CREATIONS. 530-365-8106	1/L2.1
2	BASKETBALL HALF-COURT WITH HOOP. DIMENSIONS PER DETAIL 5-8/18' MEGA DUTY FINISHED ALUMINUM FAN PLAYGROUND BASKETBALL SYSTEM. MANUFACTURER: BISON, INC.	2, 4, 6/L2.1
3	4" STANDARD CONCRETE PAVING. MEDIUM BROOM FINISH. DAVIS COLOR LIGHT GREY. PER DETAIL. EDGE OF PAVING ADJACENT TO FALL MATERIAL TO BE CONSTRUCTED PER PLAY CURB DETAIL.	3, 4/L2.1
4	4" STANDARD CONCRETE PAVING. MEDIUM BROOM FINISH. DAVIS COLOR DARK GREY. PER DETAIL. EDGE OF PAVING ADJACENT TO FALL MATERIAL TO BE CONSTRUCTED PER PLAY CURB DETAIL	3, 4/L2.1
5	TURF SOD WITH IRRIGATION MODIFICATION. SEE PLANTING AND IRRIGATION SHEETS.	2/L3.0, L4.0
6	CONCRETE ADA RAMP FROM PAVING TO FALL MATERIAL. RAMP TO MEET ADA REQUIREMENTS.	3, 4, 5/L2.1
7	PLAYGROUND SPACE WITH WOOD CHIP FALL MATERIAL. SEE DETAIL.	7, 8/L2.1
8	NET SPINNER. CONTRACTOR TO INSTALL PER MANUFACTURER'S INSTRUCTIONS. SEE STRUCTURAL CALCULATIONS AND DETAILS. MANUFACTURER: KLD ROPES. MODEL: KLD-SPIN-04. AVAILABLE VIA PARK PLANET. 877-472-7619	9/L2.1
9	GRADE ADJUSTMENT AND NEW TURF PER GRADING PLAN.	L2.2
10	4"-8" WASHED COBBLE OVER FABRIC. COBBLE TO COVER ENTIRE FABRIC.	–
11	8" THICKENED CONCRETE EDGE AT PERIMETER OF PLAYGROUND. SEE DETAIL.	7/L2.1
12	BASKETBALL CONCRETE SCORELINES AND EXPANSION JOINTS. SEE LEGEND BELOW.	2, 3, 4/L2.1
13	3" GORILLA HAIR BARK. APPLY OVER PLANTING FABRIC. PIN AT 3' O.C. THROUGHOUT.	–
14	DRAIN INLET IN BOTTOM OF PLAY AREA. SEE DETAIL.	8/L2.1 7/L2.1

CONCRETE JOINT LEGEND

– – – –	EXPANSION JOINT - 1/2" DEPTH OF CONCRETE. COVER TOP 1" OF FELT WITH ELASTOMERIC JOINT FILLER. JOINT FILLER TO MATCH CONCRETE COLOR: DAVIS DARK GREY OR LIGHT GREY	3, 4/L2.1
———	SCORELINE LAYOUT PER PLAN. 7'-0 O.C. MAX. SEE DETAIL.	3/L2.1

CONSTRUCTION/LEGEND NOTES

1. CONFIRM ALL LOCATIONS OF EXISTING UTILITIES WITHIN PROJECT SITE PRIOR TO EXCAVATION.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND REPAIR OF DAMAGE TO ALL EXISTING UTILITIES.
3. PROCURE AND INSTALL ALL ELEMENTS PER MANUFACTURERS' SPECIFICATIONS.
4. CONTRACTOR IS RESPONSIBLE TO COORDINATE HIS WORK WITH THE WORK OF OTHERS.
5. CONTRACTOR SHALL OBSERVE ALL SAFETY REGULATIONS PERTAINING TO THIS PROJECT.
6. ANY CHANGES SHALL BE APPROVED BY OWNER AND MANUFACTURER REPRESENTATIVE PRIOR TO CONSTRUCTION.
7. ALL VEGETATION, TOP SOIL AND OTHER UNSUITABLE MATERIAL IN AREAS OF FOUNDATIONS AND CONCRETE SLABS SHALL BE REMOVED FROM CONSTRUCTION AREA.
8. SEE DETAILS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9. AUTO CAD FILE AND EXISTING DRAWINGS AVAILABLE FROM LANDSCAPE ARCHITECT FOR CONSTRUCTION STAKING PURPOSES. (530) 899-1616

SCALE: 1" = 10'

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LICENSE

REGISTERED LANDSCAPE ARCHITECT
CHRISTOPHER MELTON HARRIS
12-31-22
STATE OF CALIFORNIA

CONSULTANT

CLIENT
CITY OF WHEATLAND

PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
CONSTRUCTION PLAN

DATES

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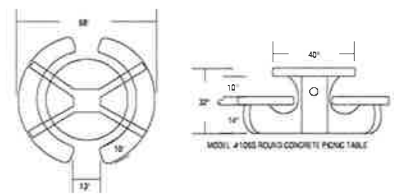
PROJECT NUMBERS
MELTON DESIGN GROUP: 2436.4
TASK ORDER
CONSULTANT PROJECT #: –

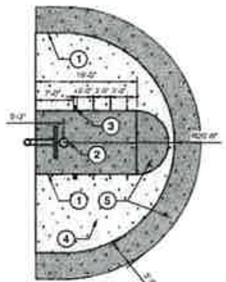
SHEET NUMBER
L2.0
SHEET 2 OF 8



WEIGHT: 2000 LBS
TEXTURE: T.B.D.
COLOR: T.B.D.
SEALER: T.B.D.

OUTDOOR CREATIONS INC.

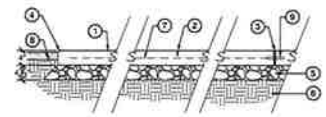
1 ROUND CONCRETE PICNIC TABLE
L2.1



1. 2" PAINTED AND SCORED LINES, COLOR: WHITE.
2. BASKETBALL HOOP ON GALVANIZED STEEL POLE. MODEL: 5-9/16" MEGA DUTY FINISHED ALUMINUM DUTY FINISHED ALUMINUM FAN PLAYGROUND BASKETBALL SYSTEM. MANUFACTURER: BISON, INC. SEE FOOTING DETAIL.
3. LOW BLOCK SCORE 12" WIDE X 8" LONG. OTHER BLOCKS SCORE X 8" LONG.
4. CONCRETE PAVING PER CONSTRUCTION PLANS AND DETAIL THIS SHEET. DAVIS COLOR: LIGHT GREY.
5. CONCRETE PAVING PER CONSTRUCTION PLANS AND DETAIL THIS SHEET. DAVIS COLOR: DARK GREY.

NOTE:
1. FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. STRIPING DIMENSIONS MATCH HIGH SCHOOL REQUIREMENTS.

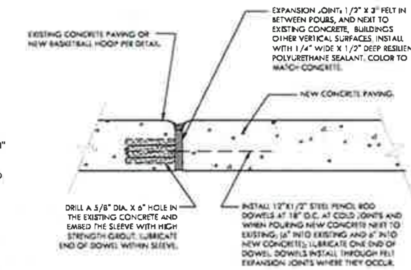
2 BASKETBALL HALF-COURT LAYOUT AND STRIPING
L2.1



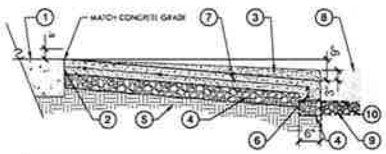
1. CONCRETE PAVING MEDIUM BROOM FINISH. 1.5% MAX CROSS SLOPE 4.5% MAX SLOPE ALONG WALKING PATH. COLOR PER CONSTRUCTION PLAN.
2. SCOREЛINE - 1-1/2" DEPTH, 1/4" WIDTH WITH 1/4" RADIUS EDGE, 7' O.C. MAX.
3. EXPANSION JOINT - 15' O.C. MAX. 1/2" X 3" FELT IN BETWEEN POURS, AND NEXT TO EXISTING CONCRETE, BUILDINGS. OTHER VERTICAL SURFACES. INSTALL WITH 1/4" WIDE X 1/2" DEEP RESILIENT POLYURETHANE SEALANT. COLOR TO MATCH CONCRETE.
4. 1/4" RADIUS TOOLED EDGE.
5. CLASS II AGGREGATE BASE COMPACTED TO 90% RELATIVE DENSITY.
6. SUB-GRADE COMPACT TO 90% RELATIVE DENSITY.
7. #4 REBAR TIED AT 24" O.C. BOTH WAYS.
8. LANDSCAPE FINISH GRADE.
9. INSTALL 12"X1/2" STEEL PENCIL ROD DOWELS AT 18" O.C. AT COLD JOINTS AND WHEN POURING NEW CONCRETE NEXT TO EXISTING. (6" INTO EXISTING AND 6" INTO NEW CONCRETE). LUBRICATE ONE END OF DOWEL. DOWELS INSTALL THROUGH FELT EXPANSION JOINTS WHERE THEY OCCUR.

NOTES:
1. PROVIDE POSITIVE DRAINAGE OF LANDSCAPE AWAY FROM CONCRETE AND STRUCTURES OR AS SEEN ON PLAN.
2. INSTALL SIDEWALK AND PADS 1-1/2" ABOVE EXISTING GRADE AS SHOWN.
3. MARK EDGE OF SIDEWALK AT SLEEVE LOCATION, BOTH SIDES OF SIDEWALK. 1/8" WIDE BY 2" LONG 1/2" O.C.
MARK (1) FOR 1" SLEEVE,
(2) FOR 2" SLEEVE,
(3) FOR 3" SLEEVE, ETC.

3 CONCRETE SIDEWALK OR PAD
L2.1

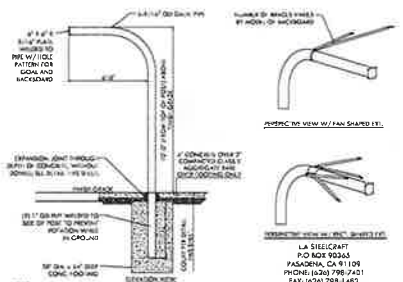


4 CONCRETE JOINT AT (N) HOOP OR (E) PAVING
L2.1

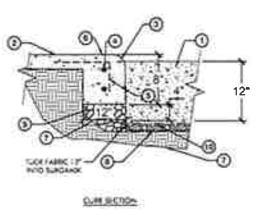


1. FINISHED GRADE, PER PLAN. RAMP ACCESS TO CONFORM TO ADA STANDARDS.
2. EDGE OF PLAY AREA PER PLAN.
3. 6" THICK CONCRETE RAMP WITH 6" HIGH CURB PER PLAN. RAMP TO COMPLY WITH ALL APPLICABLE ADA REQUIREMENTS. TOP OF CURB FLUSH WITH CONCRETE GRADE. RAMP SLOPE NOT TO EXCEED 1:12 WITH 1:48 CROSS SLOPE.
4. 4" LAYER OF CLASS #2 AGGREGATE BASE COMPACTED TO 90% RELATIVE DENSITY.
5. SUB-GRADE COMPACTED TO 90% RELATIVE DENSITY.
6. #4 REBAR, 4 MINIMUM REQUIRED (HORIZONTAL) AT 24" O.C.
7. #4 REBAR AT 24" O.C., TIE INTO ADJACENT CONCRETE CURB AND SIDEWALK. REBAR EXTENDS THROUGH CURB.
8. WOOD FIBER FALL MATERIAL. 12" MINIMUM AFTER COMPACTION.
9. 4" LAYER OF 3/4" DRAIN ROCK. SLOPE SUB GRADE TO DRAIN.
10. FABRIC LINER, TUCK 12" INTO SUBGRADE.

5 FALL MATERIAL ADA RAMP
L2.1
3/4" = 1'-0"



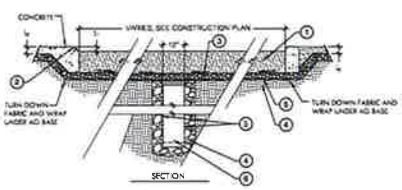
6 BASKETBALL HOOP AND FOOTING
L2.1



1. ENGINEERED WOOD FIBER. COMPACT IN 4" LIFTS TO REACH 12" MINIMUM AFTER COMPACTION.
2. 4" CONCRETE PAVING PER PLAN.
3. 2" RADIUS TOOLED EDGE.
4. #4 REBAR (HORIZ.), CONTINUOUS.
5. #4 REBAR AT 18" O.C. EXTEND HORIZONTAL 12" INTO ADJACENT PAVING.
6. CONCRETE CURB PER PLAN. CURB TO HAVE MEDIUM BROOM FINISH, ALL SAME DIRECTION. EXPANSION JOINT EVERY 12' WITH SCORE LINES 4' O.C. 1/2" AND AT BACK OF CURB RADIUS TOOLED EDGE OR SAWCUT WITH BEVEL EDGE FINISH. CURB TO BE POURED WITH ADJACENT PAVING.
7. SUB GRADE, COMPACT TO 90% RELATIVE DENSITY.
8. TYPAR PROFESSIONAL LANDSCAPE FABRIC OR EQUAL.
9. 6" MIN. LAYER OF CLASS #2 AGGREGATE BASE COMPACTED TO 90% RELATIVE DENSITY.
10. 4" LAYER OF 3/4" DRAIN ROCK. SLOPE TOWARDS DRAIN. SEE PLAN.

NOTES:
1. ENGINEERED WOOD FIBER MUST BE 12" DEEP AND COMPLY WITH ASTM F1951.
2. FIBER MUST BE MAINTAINED/REPLENISHED REGULARLY TO ENSURE 1184:2005 24.1 COMPLIANCE.

7 PLAYGROUND CURB AND FALL MATERIAL
L2.1
3/4" = 1'-0"



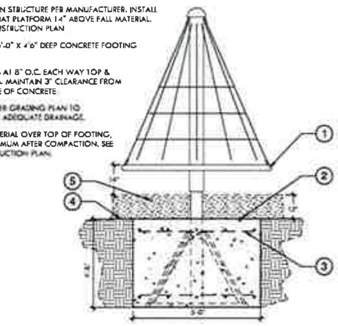
NOTES:
1. SEE CONSTRUCTION SHEETS FOR ADDITIONAL INFORMATION, AND TO DETERMINE MAXIMUM DEPTH OF FALL MATERIAL.

1. LOOSE FILL ENGINEERED WOOD FIBER. COMPACT IN 4" LIFTS TO REACH 12" MINIMUM AFTER COMPACTION.
2. THICKENED EDGE OF CONCRETE AT PLAY AREA, PER DETAIL
3. SLOPE TO TRENCH AND DRAIN PIPE MINIMUM 2%
4. COMPACTED SUBGRADE TO 95% RELATIVE DENSITY
5. GEOTEXTILE FILTER FABRIC, DEWITT 4.1 OZ., 20 YEAR FABRIC (EQUAL OR BETTER)
6. SEE DETAIL FOR SUMP REQUIREMENTS 1/L2.2

8 DRAIN IN FALL MATERIAL
L2.1

KLD ROPES MODEL: KLD-SPIN-04
FOOTINGS FOR BIDDING ONLY
SEE ENGINEERING SHEETS.
FINISH: T.B.D.
AVAILABLE FROM PARK PLANET

1. PLAY SPIN STRUCTURE PER MANUFACTURER. INSTALL SUCH THAT PLATFORM 14" ABOVE FALL MATERIAL. SEE CONSTRUCTION PLAN
2. 5'-0" X 5'-0" X 4'6" DEEP CONCRETE FOOTING
3. #4 BARS AT 8" O.C. EACH WAY TOP & BOTTOM. MAINTAIN 3" CLEARANCE FROM SURFACE OF CONCRETE
4. SLOPE PER GRADING PLAN TO ACHIEVE ADEQUATE DRAINAGE.
5. FILL MATERIAL OVER TOP OF FOOTING, 12" MINIMUM AFTER COMPACTION. SEE CONSTRUCTION PLAN.



Product Number:	KLD-SPIN-04
Product Collection:	Spinner
Size:	Diameter: 3.30 m / 10'10"; Height: 3.57 m / 11'9"
Fall Height:	2.81 m / 9'3"
Foundation:	1
Concrete Volume:	No Concrete Required

COMPLIANT WITH:	EN 1176	ASTM F-1487	CSA Z614
Age:	5 - 12 years	5 - 12 years	5 - 12 years
Capacity:	35	35	35
Use Zone:	Diameter: 7.20 m / 23'7"	7.26 m / 23'10"	8.70 m / 28'7"

TECHNICAL DETAILS:

Main Support Post

Rotational Post

Rope

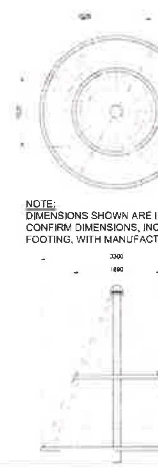
Ball Knots

Net Connections

Bearings

Decking

NOTE:
DIMENSIONS SHOWN ARE IN MM.
CONFIRM DIMENSIONS, INCLUDING FOOTING, WITH MANUFACTURER.



9 CABLE SPINNER
L2.1

MDG MELTONDESIGNGROUP
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CHICO, CA 95928
(530) 899-1616
meltondg.com

LICENSE

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CITY OF WHEATLAND

PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
CONSTRUCTION DETAILS

DATES

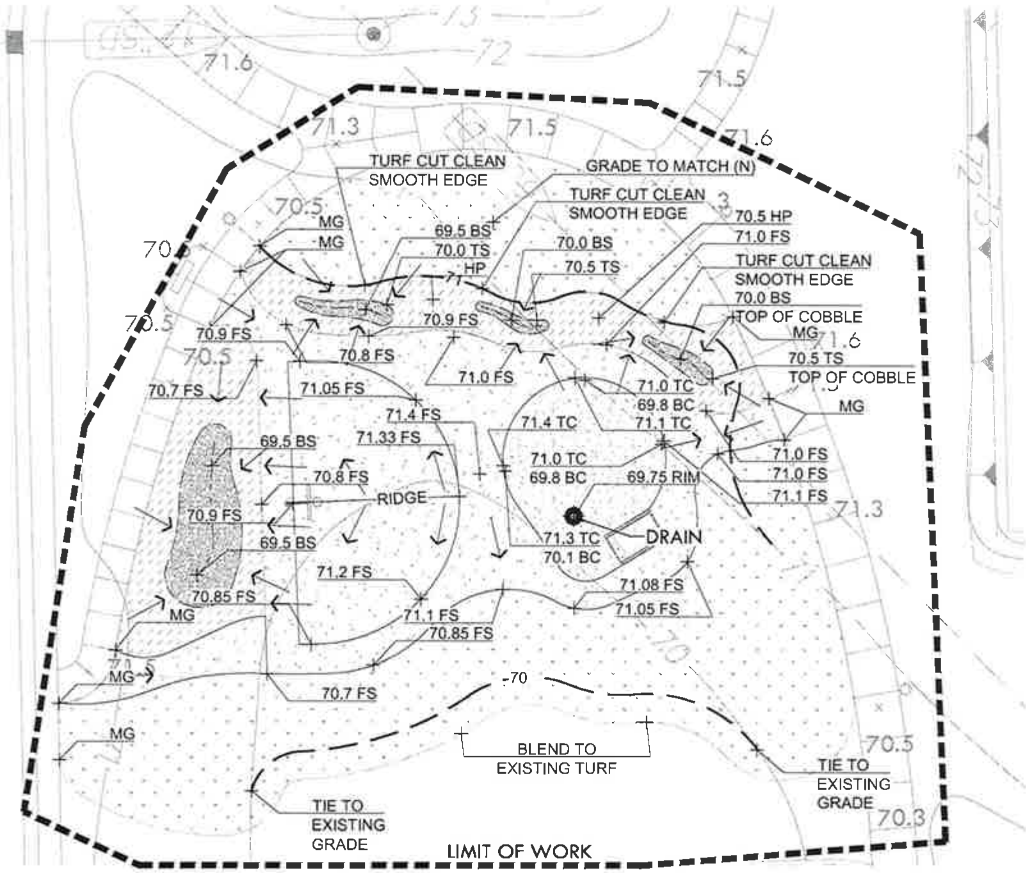
NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Plans Rename	2022-03-15
5.	-	-
6.	-	-
7.	-	-
8.	-	-

PLOT DATE: —

PROJECT NUMBERS
MELTON DESIGN GROUP: 2436.4
TASK ORDER
CONSULTANT PROJECT #: —

SHEET NUMBER
L2.1

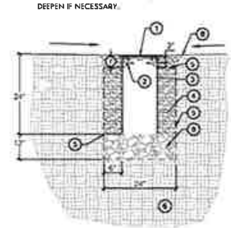
PLOT DATE: March 18, 2022 - 3:04 PM



GENERAL GRADING NOTES

1. CONTACT LANDSCAPE ARCHITECT PRIOR TO GRADING IN THE EVENT THAT EXISTING GRADES FOR CONDITIONS ARE NOT AS SHOWN ON PLANS. ANY OFFITE OR ADJACENT AREAS DISTURBED BY CONSTRUCTION OR CONTRACTOR OPERATOR SHALL BE RESTORED BY CONTRACTOR TO PREVIOUS CONDITION AND TO SATISFACTION OF INSPECTOR.
2. ELIMINATE ALL LOCALIZED DEPRESSIONS OR "BIRD BATHS" UNLESS DRAINED BY CATCH BASIN.
3. PROVIDE SMOOTH CONTINUOUS CURVE AT TOPS AND BOTTOM OF SLOPES AS YOU CONFORM TO EXISTING GRADES. ALL CONCRETE TRANSITIONS TO EXISTING PAVING SHALL BE SMOOTH.
4. SMOOTH OUT TRANSITIONS TO ALL DRAIN INLETS. VERIFY RIM ELEVATIONS IN FIELD AT TIME OF STAKING WITH CITY REPRESENTATIVE PRIOR TO SETTING. ADJUST TO FINISH GRADE.
5. GRADE IN PLANTING TO BE BELOW WALK AND PATH TO ALLOW FOR BARK SURFACE. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE THROUGHOUT FOR ALL SWALES, BERMS, AND BASINS.
6. AUTO CAD FILE AVAILABLE FROM LANDSCAPE ARCHITECT FOR LAYOUT PURPOSES. (530) 899-1616.
7. PROVIDE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES AND SLABS TO BASINS, SWALES, OR DRAINAGE AREAS.
8. ACCESS TO SITE AND ROADS AND SIDEWALKS AROUND SITE TO BE KEPT CLEAN OF DIRT AND SOIL THROUGHOUT PROJECT. TRUCK TIRES SHALL BE WASHED DOWN AND SEDIMENT COLLECTED ON PROJECT SITE.
9. ALL EXCAVATED MATERIAL NOT SUITED FOR FILL (ORGANIC MATTER, ROOTS, SOD, ETC.) SHALL BE REMOVED AND LEGALLY DISPOSED OF OFFSITE.
10. CONTOURS AND SPOT ELEVATIONS SHOULD BE LOCATED AT TOP OF CONCRETE OR OTHER FINISH SURFACES.
11. STRIP GRADED AREAS DOWN TO COMPETENT SOIL, REMOVING ALL ORGANIC MATTER.

DRAINAGE NOTE:
FIELD TEST DRAINAGE OF SUMP. DEEPEN IF NECESSARY.



1. 12" ROUND DROP-IN, STEEL DRAIN GRATE (1299CGPL NYOPLAST). GRATE FIT INSIDE SDR 35 PVC RISER EXTENSION.
2. STAINLESS STEEL LOCKING OPTION - USE ON RISER ONLY. INSTALL 2" BELOW FINISH GRADE.
3. 12" SDR-35 SEWER PVC RISER OR APPROVED EQUAL; KEEP BOTTOM OPEN.
4. 3/4" CLASS II AGGREGATE COMPACTED TO 90% R.D.
5. 100% POLYPROPYLENE NON-WOVEN HEAVY DUTY FILTER FABRIC. OVERLAP EDGES 6" MIN. AND SECURE WITH STAPLES AT 1.2 STAPLES PER SQ. YD.
6. NATIVE BACKFILL
7. 3" SAND/SOIL MIX 50/50
8. FINISH GRADE - SLOPE TO DRAIN PER GRADING PLAN, SHEET L-1.0
9. 3/4" WASHED DRAIN ROCK

1 / L2.2 DRAIN INLET TO SUMP

GRADING LEGEND

EXISTING CONTOUR - 1' INTERVAL
EXISTING SPOT ELEVATION
PROPOSED CONTOUR LINE
PROPOSED 1' SWALE CONTOURS; GRADE DRAINAGE TO SWALE
PROPOSED 1' BASIN CONTOURS; GRADE DRAINAGE TO SWALE
SPOT ELEVATION
DIRECTION OF SLOPE AND DRAINAGE
DRAIN INLET - SEE DETAIL THIS SHEET

ABBREVIATIONS:

FS	FINISH SURFACE	HP	HIGH POINT
FG	FINISH GRADE	TW	TOP OF WALL ELEVATION
TC	TOP OF CONCRETE	BW	BOTTOM OF WALL ELEVATION
BC	BOTTOM OF CONCRETE	RIM	DRAIN INLET RIM ELEVATION
FF	FINISH FLOOR ELEVATION	BS	SWALE BOTTOM
LP	LOW POINT	TS	TOP OF SWALE
TG	TURF GRADE	MC	MOW CURB
BB	BOTTOM OF BANK	MG	MATCH GRADE
TB	TOP OF BANK		

4-8" MIX COBBLE OVER FABRIC. COBBLE TO COVER ALL FABRIC.

GORILLA HAIR BARK 3" THICK OVER LANDSCAPE FABRIC. STAPLE 3' O.C. EACH DIRECTION.

PROPOSED TURF SEE PLANTING PLAN.

NORTH

0 10 20
SCALE: 1" = 10'

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PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
GRADING PLAN

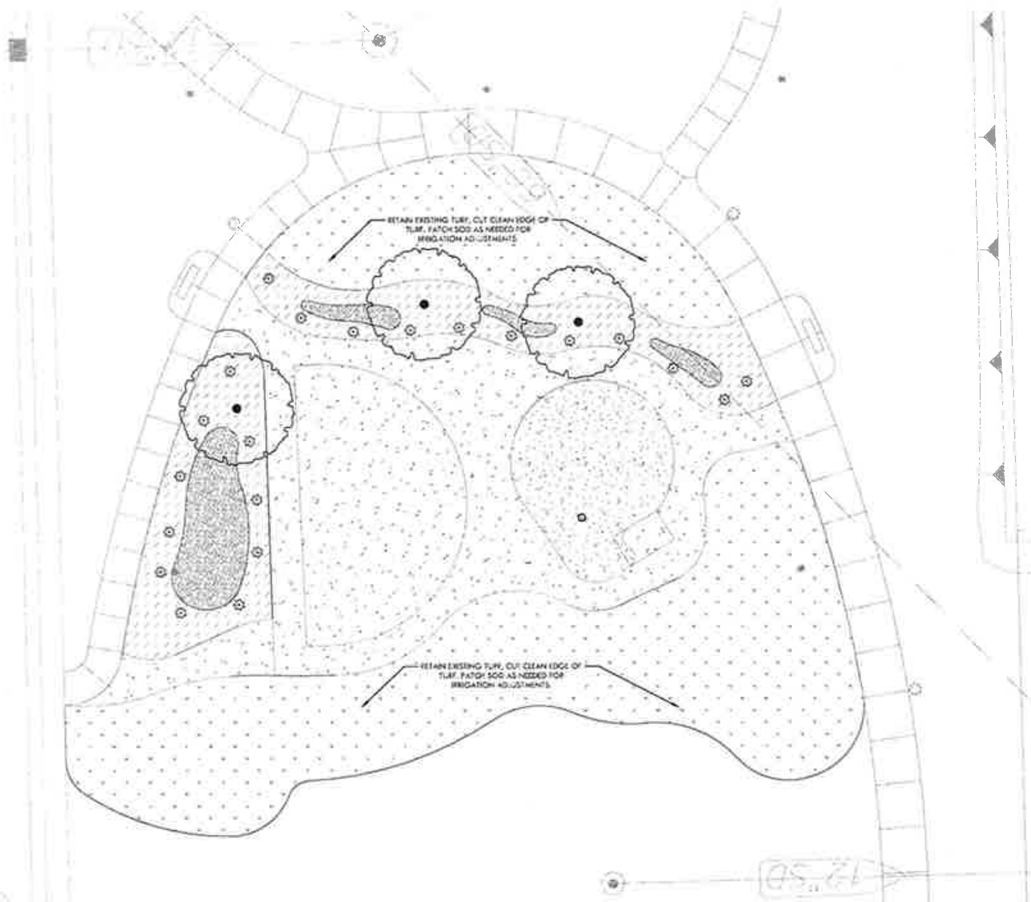
DATES

NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Plans Rename	2022-03-15
5.	--	--
6.	--	--
7.	--	--
8.	--	--

PLOT DATE: --

PROJECT NUMBERS
MELTON DESIGN GROUP: 2436.4
TASK ORDER
CONSULTANT PROJECT #: --

SHEET NUMBER
L2.2
SHEET 5 OF 8



PLANT SCHEDULE

TREES	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
(tree symbol)	LT	LIRIODENDRON TULIPIFERA	TULIP POPLAR	15 GAL	3
SHRUBS	**CODE**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**QTY**
(shrub symbol)	JB	JUNCUS INFLEXUS	BLUE ARROWRUSH	1 GAL	21

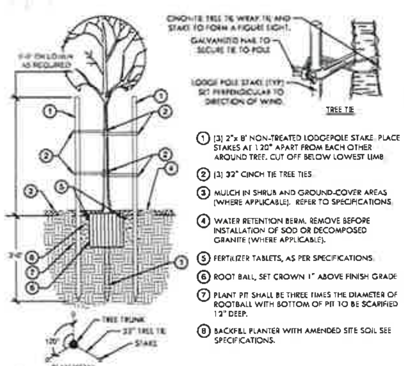
PLANTING NOTES

1. VERIFY EXACT LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
2. ALL PLANT MATERIAL TO BE SET UP FOR REVIEW BY LANDSCAPE ARCHITECT OR CITY INSPECTOR PRIOR TO INSTALLATION. NO SUBSTITUTIONS FOR PLANT MATERIAL WILL BE ALLOWED UNLESS PRIOR ARRANGEMENTS HAVE BEEN APPROVED BY LANDSCAPE ARCHITECT. IN THE EVENT OF PLANT MATERIAL UNAVAILABILITY, CONTACT LANDSCAPE ARCHITECT FOR ALTERNATIVE SOURCES OR APPROVED SPECIES SUBSTITUTION.
3. PLANT QUANTITIES ARE FOR CONVENIENCE OF THE CONTRACTOR. CONTRACTOR TO CONFIRM EXACT NUMBER.
4. TREE STAKES ARE TO BE PLACED PERPENDICULAR TO PREVAILING WINDS. REMOVE NURSERY STAKES, REPLACE WITH STAKES PER DETAIL. TREE TIES SHALL BE CINCH-TIE OR EQUAL.
5. REFER TO PLANS, DETAILS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. PLANT MATERIAL SHALL BE BID ON THE BASIS OF SPECIES AND CONTAINER SIZE, NOT ON CONTAINER SIZE ALONE.

NEW TURF

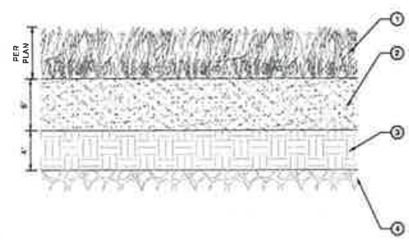
RTF FESTUCA ARUNDINACEA RHIZOMATIC TALL FESCUE

RETAIN AND PROTECT EXISTING TURF. PATCH WHERE REQUIRED FOR IRRIGATION ADJUSTMENTS. CREATE CLEAN EDGES OF TURF.



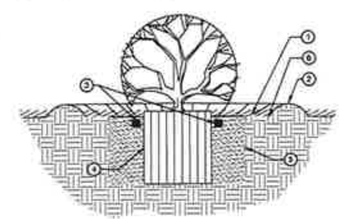
1. (3) 2"x 8' NON-TREATED LODGEPOLE STAKE. PLACE STAKES AT 120° APART FROM EACH OTHER AROUND TREE. CUT OFF BELOW LOWEST LIMB.
2. (3) 32" CINCH TIE TREE TIES.
3. MULCH IN SHRUB AND GROUND-COVER AREAS (WHERE APPLICABLE). REFER TO SPECIFICATIONS.
4. WATER RETENTION BERM. REMOVE BEFORE INSTALLATION OF SOD OR DECOMPOSED GRANITE (WHERE APPLICABLE).
5. FERTILIZER TABLETS, AS PER SPECIFICATIONS.
6. ROOT BALL, SET CROWN 1" ABOVE FINISH GRADE.
7. PLANT PIT SHALL BE THREE TIMES THE DIAMETER OF ROOTBALL WITH BOTTOM OF PIT TO BE SCARIFIED 12" DEEP.
8. BACKFILL PLANTER WITH AMENDED SITE SOIL SEE SPECIFICATIONS.

1 L3.0 TREE PLANTING IN MULCH
1/2" = 1'-0"



1. SOD AS SPECIFIED; SEE PLANTING PLAN AND GRADING PLAN.
2. 6" NATIVE SOIL BLENDED WITH SOIL AMENDMENTS AS INDICATED BY SOILS REPORT.
3. 4" SCARIFIED SUB-GRADE.
4. BASE LAYER UNDISTURBED.

2 L3.0 SOD TURF INSTALLATION
N.T.S.



1. BARK MULCH PER PLAN.
2. WATER RETENTION BERM, PROVIDE POSITIVE DRAINAGE AWAY FROM ROOTBALL.
3. FERTILIZER TABLETS, AS PER SPECIFICATIONS.
4. ROOT BALL, SET CROWN 1" ABOVE GRADE.
5. PLANTING PIT TO BE TWICE THE DIAMETER OF ROOTBALL. REFER TO SPECIFICATIONS FOR BACKFILL MIX.
6. FINISH GROUNDCOVER GRADE.

3 L3.0 SHRUB PLANTING
3/4" = 1'-0"

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PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
PLANTING PLAN

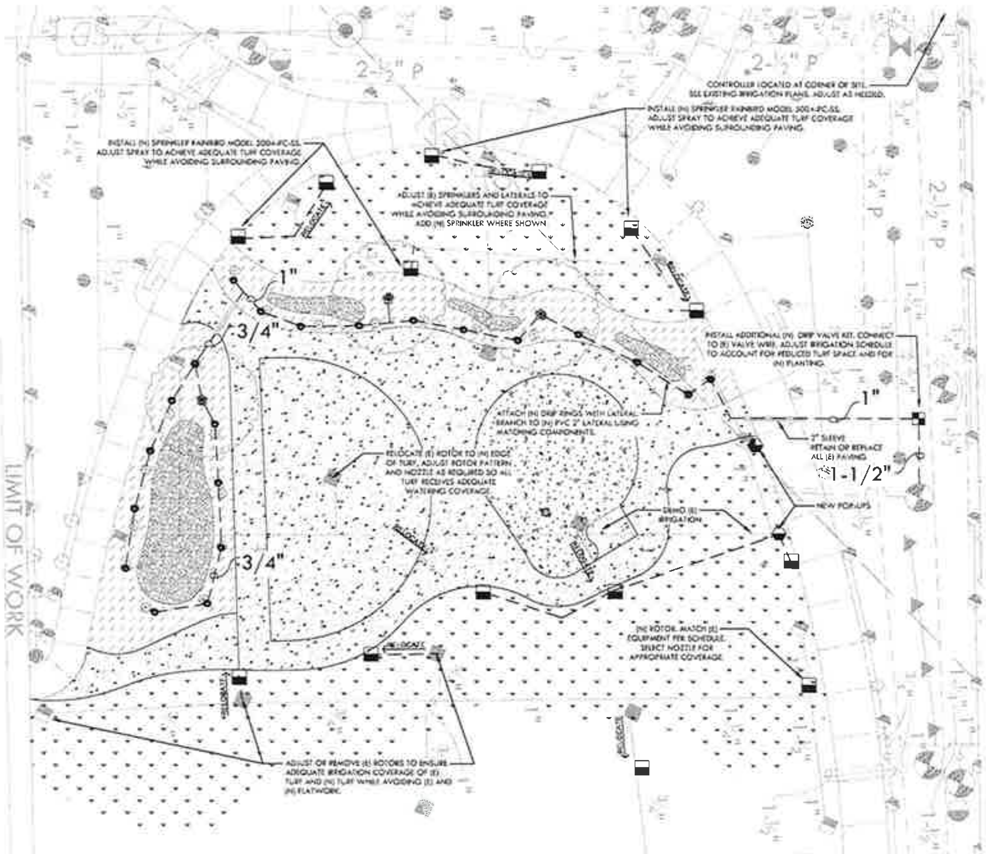
DATES

NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Park Rename	2022-03-16
5.	-	-
6.	-	-
7.	-	-
8.	-	-

PLOT DATE: -

PROJECT NUMBERS
MELTON DESIGN GROUP: 2436.4 TASK ORDER
CONSULTANT PROJECT #: -

SHEET NUMBER
L3.0



IRRIGATION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY EXISTING CONDITIONS. COORDINATE WITH OWNER TO REVIEW IRRIGATION SYSTEM PRIOR TO START OF WORK. IN THE EVENT THAT EXISTING CONDITIONS ARE DIFFERENT THAN STATED, CONTACT LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.

2. THE INTENT OF THIS IRRIGATION SYSTEM IS TO PROVIDE THE MINIMUM AMOUNT OF WATER REQUIRED TO SUSTAIN GOOD PLANT HEALTH. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROGRAM THE IRRIGATION CONTROLLER BASED ON RECOMMENDATIONS FROM THE LANDSCAPE WATER AUDIT AND AS REQUIRED BY THE 2020 UPDATED MODEL WATER EFFICIENT LANDSCAPE ORDINANCE, CALIFORNIA CODE OF REGULATIONS TITLE 23, DIVISION 2, CHAPTER 2.7 AND EXISTING FIELD CONDITIONS. THE CONTRACTOR SHALL MAKE SCHEDULING ADJUSTMENTS AS NEEDED TO ACHIEVE THE MOST EFFICIENT APPLICATION OF WATER BASED ON PLANT TYPE, WATER USE REQUIREMENTS, SOIL TYPE, GRADES, SUN EXPOSURE, SHADE, WIND, ETC.

3. THIS DRAWING IS DIAGRAMMATIC. IRRIGATION COMPONENTS SHOWN BENEATH PAVING, UTILITIES, PLANTINGS, ETC. ARE FOR GRAPHIC CLARITY ONLY. PLACE ALL PIPING, VALVES, AND OTHER IRRIGATION COMPONENTS WITHIN THE ADJACENT PLANTER EXCEPT WHERE PIPES CROSSOVER BENEATH PAVING, STRUCTURES, WALLS, ETC.. THE CONTRACTOR SHALL PLACE PIPING TO PREVENT CONFLICT WITH UTILITIES, TREE LOCATIONS, PLANTING, HARDSCAPE COMPONENTS, WATER PLAY FEATURES, PLAY AREAS AND FURNISHINGS. SEE PLANTING PLAN FOR PLANT COUNT AND LAYOUT. REFER TO CONTRACT DOCUMENTS FOR PROJECT SCOPE.

4. THE CONTRACTOR SHALL PROVIDE COMPLETE RECORD AS-BUILT DRAWINGS IN DIGITAL FORMAT TO OWNER AT COMPLETION OF PROJECT FOR REVIEW AND ACCEPTANCE AND AS REQUIRED BY CONTRACT DOCUMENTS.

5. ALL IRRIGATION SHALL BE INSTALLED BY CONTRACTOR AT THE LOCATIONS INDICATED ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT OF ANY DEVIATION WHICH MAY AFFECT THE SPACING OR LOCATION OF THE IRRIGATION LAYOUT.

6. TRENCH IRRIGATION MAIN LINES TO A DEPTH OF 24", TRENCH ROTOR LINES TO A DEPTH OF 18", TRENCH DRIP LINES TO A DEPTH OF 2"-4". TRENCH ALL MAIN AND LATERAL LINES TO A DEPTH OF 24" WHERE CROSSING BENEATH PAVEMENT AND PLACE WITHIN SLEEVE, SIZE AND TYPE PER PLAN. SLEEVE CONTROL AND COMMON WIRES SEPARATELY IN 3" PVC SCHEDULE 40 CONDUIT ALONG ENTIRE LENGTH AND WHEN CROSSING BENEATH PAVEMENT AS REQUIRED.

7. CONTRACTOR SHALL BE RESPONSIBLE TO SLEEVE ALL MAIN LINES AND LATERAL LINES WHEN CROSSING BENEATH PAVEMENT, WALKWAYS, BUILDINGS, WALLS, ETC. WHETHER OR NOT SHOWN ON THE IRRIGATION PLAN. SIZE PER PLAN AND/OR AS NEEDED BASED ON THE NUMBER OF IRRIGATION LINES AND SIZES. CONTROL WIRES SHALL BE SLEEVED INDEPENDENTLY. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH OTHER TRADES TO INSTALL SLEEVES REQUIRED.

8. ALL IRRIGATION: REMOTE CONTROL VALVES, QUICK COUPLER VALVES, ELECTRIC PULL BOXES SHALL BE INSTALLED IN PLANTED AREAS AND IN VALVE BOXES. NO VALVES/VALVE BOXES SHALL BE INSTALLED IN PAVED AREAS OR IN TURF AREAS. VALVE BOXES SHALL BE GREEN.

9. THE CONTRACTOR SHALL BE RESPONSIBLE TO RESCHEDULE THE (E) REMOTE VALVE AT CONTROLLER AND BE RESPONSIBLE TO COORDINATE WITH OTHERS. PROVIDE OWNER TRAINING ON CONTROLLER SCHEDULING FOR BOTH ESTABLISHMENT AND MAINTENANCE SCHEDULES.

10. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A COMPLETE LANDSCAPE WATER AUDIT PER REQUIREMENTS SET FORTH IN THE 2020 UPDATED MODEL WATER EFFICIENT LANDSCAPE ORDINANCE, CALIFORNIA CODE OF REGULATIONS TITLE 23, DIVISION 2, CHAPTER 2.7. CONTRACTOR SHALL MAKE FINAL ADJUSTMENTS TO THE IRRIGATION SYSTEM BASED ON LANDSCAPE WATER AUDIT RECOMMENDATIONS. SEE CONTRACT DOCUMENTS.

11. SEE CONTRACT DOCUMENTS, SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.

12. EXISTING IRRIGATION AND PLANTING PLANS AND DETAILS AVAILABLE FROM LANDSCAPE ARCHITECT.

IRRIGATION SCHEDULE

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
■	REMOTE CONTROL DRIP ZONE: HUNTER ICZ-101-25 1" DRIP CONTROL ZONE KIT. 1" ICV GLOBE VALVE WITH 1" HY100 FILTER SYSTEM. PRESSURE REGULATION: 25PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN	1
●	DRIP SHRUB RING HDL-06-12 PC HDL-06-12 PC: PRESSURE COMPENSATING HUNTER DRIPLINE WITH 0.6 GPH FLOW. LIGHT BROWN TUBING WITH BLACK STRIPING. EMITTERS AT 12" O.C. X 0.6GPH AT 12" O/C SPACING PER SHRUB RING	21
⊛	DRIP TREE RING HDL-06-12 PC HDL-06-12 PC: PRESSURE COMPENSATING HUNTER DRIPLINE WITH 0.6 GPH FLOW. LIGHT BROWN TUBING WITH BLACK STRIPING. EMITTERS AT 12" O.C. X 0.6GPH AT 12" O/C SPACING PER TREE RING	3

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
— — —	IRRIGATION LATERAL LINE: PVC SCHEDULE 40. ATTACH TO (E)
(shaded band)	PIPE SLEEVE: PVC SCHEDULE 40 SCHEDULE 40 PVC AT 2X LINE SIZE FOR LATERALS, CONDUIT & MAINLINE UNDER ALL PAVING, TYPICAL, WHETHER SHOWN OR NOT. COORDINATE LOCATIONS WITH GENERAL CONTRACTOR PRIOR TO PAVING INSTALLATION. WIRES AND MAINLINE SHALL BE PLACED ON SEPARATE SLEEVES.
■ ⬓	REUSE EXISTING ROTORS WHERE POSSIBLE, REPLACING NOZZLES TO ADJUST WATER APPLICATION FOR REDUCED TURF AND (N) PLANTING. USE NEW HEADS AS NEEDED.

IRRIGATION DETAIL INDEX

NUMBER	TITLE
1/L4.1	TREE RING
2/L4.1	SHRUB RING
3/L4.1	DRIP LINE START CONNECTION
4/L4.1	REMOTE CONTROL DRIP ZONE ASSEMBLY
5/L4.1	POP UP SPRINKLER
6/L4.1	POP-UP ROTOR
7/L4.1	IRRIGATION BOX LAYOUT

EXISTING IRRIGATION LEGEND

SYMBOL	DESCRIPTION	in./hr.
◒ ◓	RAINBIRD, 1806 POP-UP SPRAY HEAD W/ 5 MPR NOZZLE.	1.83
◒ ◓	RAINBIRD, 1806 POP-UP SPRAY HEAD W/ 8 MPR NOZZLE.	1.83
●	RAINBIRD, 1806 POP-UP SPRAY HEAD W/ 8 VAN NOZZLE.	N/A
▲ ▲ ▲	RAINBIRD, 1806 POP-UP SPRAY HEAD W/ 10 MPR NOZZLE.	1.75
● ● ● ●	RAINBIRD, 1806 POP-UP SPRAY HEAD W/ 15 MPR NOZZLE.	1.83
■ ⬓ ⬒	RAINBIRD, 5000 SERIES ROTOR: 5004-FC-SS W/6.0 NOZZLE (FULL CIRCLE); 5004-PC-SS W/3.0 NOZZLE (3/4, 1/2, 1/3 CIRCLE); 5004-PC-SS W/1.5 NOZZLE (1/4 CIRCLE).	0.47
M	INVENSYS SERIES "W" TURBO WATER METER W/ TOUCHREAD AUTOMATED METER READING AND BILLING SYSTEM. READ IN CFS. SIZE AS NOTED.	
⧗	FEBCO 825 YA HIGH HAZARD BACKFLOW PREVENTOR, SIZE AS NOTED. COVER WITH A WORLD WIDE CANVAS INSULTATING BLANKET, SIZE AS REQUIRED, PER MANUFACTURER'S RECOMMENDATIONS WITH PADLOCK.	
A	UNITED GREENTECH RAIN MASTER DX2 SERIES CONTROLLER ASSEMBLY: CAS-RM2-18/FSAV-200P W/CABLE FV-CAB-SEN IN 1" PVC SCH. 40 CONDUIT	
B	UNITED GREENTECH RAIN MASTER DX2 SERIES CONTROLLER ASSEMBLY: CAS-RM2-6/FSAV-150P W/CABLE FV-CAB-SEN IN 1" PVC SCH. 40 CONDUIT	
⋈	NIBCO, 1-113 LINE SIZE GATE VALVE, INSTALL IN A PLASTIC VALVE BOX FLUSH TO FINISH GRADE	
◕	RAINBIRD, PEB SERIES REMOTE CONTROL VALVE , SIZE PER PLAN. INSTALL IN A PLASTIC VALVE BOX WITH BOLT DOWN LID.	
◓	RAINBIRD, 33DLRC QUICK COUPLING VALVE. INSTALL IN A PLASTIC VALVE BOX WITH BOLT DOWN LID. SET TOP FLUSH TO FINISH GRADE.	
——	MAINLINE, PVC SCHEDULE 40 PIPE, 24" MIN. BURIAL, SIZE PER PLAN.	
——	LATERAL, CLASS 200 PVC PIPE, 12-18" MIN. BURIAL, SIZE PER PLAN. ALL UNSIZED PIPE SHALL BE 3/4" SIZE.	
═	SLEEVE, SCHEDULE 40 PVC PIPE, SIZE PER PLAN OR AS REQUIRED	
A00 / 1-1/2 / 36 GPM	VALVE # / APPROXIMATE FLOW THROUGH VALVE / VALVE SIZE	

EXISTING IRRIGATION NOTES:

EXISTING EQUIPMENT ON SITE INCLUDES BUT NOT LIMITED TO: DRINKING FOUNTAIN, CONTROLLER ASSEMBLY, WATER METER, BACKFLOW PREVENTOR, GATE VALVE, REMOTE CONTROL VALVE, POP-UP SPRINKLER, QUICK-COUPLING VALVE, POP-UP ROTOR, IRRIGATION PIPE, FITTINGS, AND COMPONENTS.

SEE ORIGINAL PROJECT PLANS, AVAILABLE FROM LANDSCAPE ARCHITECT.

CONTRACTOR TO PROVIDE AS-BUILTS IN DIGITAL FORMAT FOR REVIEW AND ACCEPTANCE.

NORTH

0 10 20

SCALE: 1" = 10'

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CITY OF WHEATLAND

PROJECT
SPRUCE PARK RENOVATION

SHEET TITLE
IRRIGATION PLAN

DATES

NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Park Rename	2022-03-15
5.	-	-
6.	-	-
7.	-	-
8.	-	-

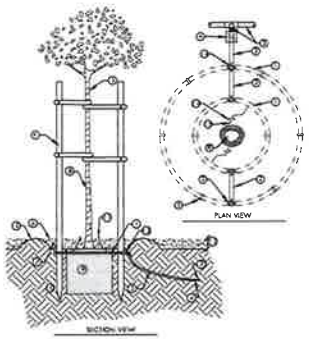
PLOT DATE: -

PROJECT NUMBERS
MELTON DESIGN GROUP: 2436.4
TASK ORDER
CONSULTANT PROJECT #: -

SHEET NUMBER
L4.0

SHEET 7 OF 8

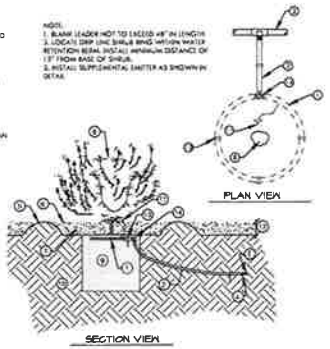
1. DRIP LINE TREE RING - MANUFACTURER AND MODEL PER PLAN.
2. BLANK DRIP LINE TO PVC LATERAL
3. PVC LATERAL LINE
4. START CONNECTION. SEE DETAIL 2/L-3.3
5. WATER RETENTION BERM AS PER PLANTING PLAN
6. FINISH GRADE
7. TOP DRESSING PER PLANTING PLAN
8. TREE PLANTINGS PER PLANTING PLAN
9. PLANTING HOLE BACKFILL MIX PER PLANTING PLAN.
10. NATIVE SUBGRADE
11. SUPPLEMENTAL EMITTER PER 6/L-3.9. TYPICAL 2 PLACES PER TREE. PLACE EMITTERS ON TOP OF FINISH GRADE AT EACH SIDE OF TREE.
12. 3" BARE. SEE PLANTING PLAN
13. BARB 5 BARB DRIP FITTING PER MANUFACTURER'S SPECIFICATIONS
14. 6" GALVANIZED SOIL STAPLE; INSTALL AT 3' INTERVALS ALONG ENTIRE LENGTH OF DRIP LINE AND AT EMITTERS. USE 3 AT FITTINGS IN CRISS-CROSSED FASHION.
15. 1 GPH EMITTER ON 1/4" DISTRIBUTION TUBING; CONNECT TO SUBSURFACE DRIP LINE AND BRING TO SURFACE AND SECURE WITH 6" GALVANIZED SOIL STAPLE APPROXIMATE 1/2 DISTANCE FROM TREE TRUNK AND OUTER LIMIT OF ROOT BALL. (TYPICAL 2 PLACES PER TREE)



NOTE:
1. BLANK LEADER NOT TO EXCEED 48" IN LENGTH
2. LOCATE DRIP LINE SHRUB RING WITHIN WATER RETENTION BERM. INSTALL MINIMUM DISTANCE OF 12" FROM BASE OF SHRUB.
3. INSTALL SUPPLEMENTAL EMITTER AS SHOWN IN DETAIL

1 TREE RING
L4.1 — SCALE: N.T.S.

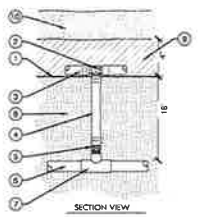
1. DRIP LINE SHRUB RING - MANUFACTURER AND MODEL PER PLAN.
2. BLANK DRIP LINE TO PVC LATERAL; NOT TO EXCEED 48" IN LENGTH
3. PVC LATERAL LINE
4. START CONNECTION. SEE DETAIL 2/L-3.3
5. WATER RETENTION BERM AS PER PLANTING PLAN
6. FINISH GRADE
7. TOP DRESSING PER PLANTING PLAN
8. SHRUB PLANTING PER PLANTING PLAN
9. PLANTING HOLE BACKFILL MIX PER PLANTING PLAN
10. NATIVE SUBGRADE
11. 1 GPH EMITTER ON 1/4" DISTRIBUTION TUBING; CONNECT TO SUBSURFACE DRIP LINE AND BRING TO SURFACE AND SECURE WITH 6" GALVANIZED SOIL STAPLE APPROXIMATE 1/2 DISTANCE FROM TREE TRUNK AND OUTER LIMIT OF ROOT BALL (TYPICAL 2 PLACES PER TREE)
12. APPROVED TOP DRESSING. SEE PLANTING PLAN.
13. 6" GALVANIZED SOIL STAPLE; INSTALL AT 3' INTERVALS ALONG ENTIRE LENGTH OF DRIP LINE AND AT EMITTERS. USE 3 AT FITTINGS IN CRISS-CROSSED FASHION.
14. BARB Y BARB DRIP FITTING PER MANUFACTURER'S SPECIFICATIONS



NOTE:
1. BLANK LEADER NOT TO EXCEED 48" IN LENGTH
2. LOCATE DRIP LINE SHRUB RING WITHIN WATER RETENTION BERM. INSTALL MINIMUM DISTANCE OF 12" FROM BASE OF SHRUB.
3. INSTALL SUPPLEMENTAL EMITTER AS SHOWN IN DETAIL

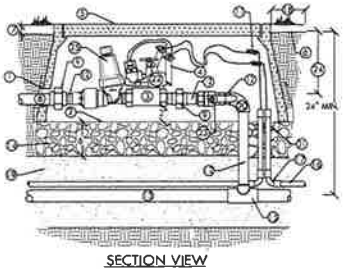
2 SHRUB RING
L4.1 — SCALE: N.T.S.

1. FINISH GRADE- SEE LANDSCAPE PLAN
2. DRIP LINE TEE
3. DRIP LINE ON SURFACE; DRIP LINE MANUFACTURER PER PLAN
4. BLANK TUBING, LENGTH AS NEEDED
5. 3/4" MALE ADAPTER
6. PVC SCHEDULE 40 SUB HEADER
7. PVC SCHEDULE 40 TEE WITH 3/4" THREADED OUTLET
8. UNIFORMLY PREPARED SUBGRADE COMPACTED TO 90% RELATIVE DENSITY, SEE DRIP LINE MANUFACTURER'S SPECIFICATIONS.
9. 4" APPROVED BACKFILL
10. MULCH OR DECOMPOSED GRANITE LAYER PER PLANTING PLAN



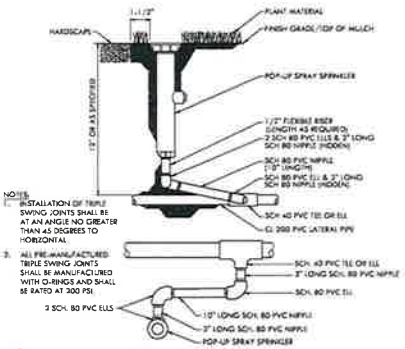
NOTE:
SECURE DRIP LINE TO FINISH GRADE USING 6" WIRE STAPLES. INSTALL WIRE STAPLES EVERY THREE (3) FEET.

3 DRIP LINE START CONNECTION
L4.1 — N.T.S.



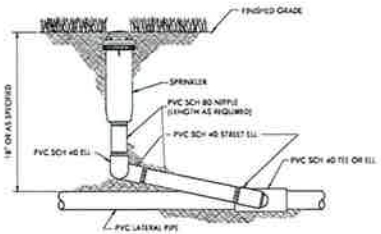
1. TRIM VALVE BOX TO PROVIDE 1" CLEARANCE OVER PIPE
2. 1/4" GALVANIZED WIRE CLOTH - INSTALL ON TOP OF CRUSHED DRAIN ROCK 6" BEYOND EDGE OF VALVE BOX IN ALL DIRECTIONS.
3. REMOTE CONTROL VALVE ASSEMBLY; NORMALLY OPEN, SIZE AND MODEL PER PLAN.
4. LOCKING WATERPROOF WIRE CONNECTOR, DBR/Y-6 OR APPROVED EQUAL.
5. CARSON PLASTIC VALVE BOX 1220 WITH LOCK KIT AND L-BOLT, GREEN OR APPROVED EQUAL. VALVE BOX TO BE LARGE ENOUGH TO ENCLOSE ENTIRE VALVE ASSEMBLY. LID MARKED IRRIGATION.
6. FINISH GRADE - SEE GRADING PLAN.
7. SET TOP OF BOX ABOVE SUBGRADE: 2-1/4" DECOMPOSED GRANITE; 1-1/2" IN TURF. SET VALVE BOX HEIGHT TO MATCH GRADE OF ADJACENT HARDSCAPE.
8. PVC LATERAL LINE; SIZE AND TYPE PER PLAN. PROVIDE 18" LENGTH PRIOR TO FIRST FITTING.
9. SCHEDULE 80 PVC UNION, SXS (TYP. 2 PLCS.)
10. PVC SCHEDULE 80 90 DEG ELBOW, SXS
11. 12 GA COMMON WIRE (WHITE), 14 GA CONTROL WIRE (RED) PER SPECIFICATIONS - PROVIDE 24" SPARE LOOP WRAPPED NEAT ALONG INTERIOR VALVE BOX. INSTALL (1) SPARE 12 GA COMMON WIRE (GREEN) AND (1) SPARE 14 GA CONTROL WIRE (YELLOW) ALONG ENTIRE MAIN LINE AND LOOPED INTO EACH VALVE BOX.
12. PVC SCHEDULE 80 T.O.E. NIPPLE, LENGTH AS NEEDED, MIN. 6" LENGTH
13. PVC MAIN LINE; SIZE AND TYPE PER PLAN. 24" MINIMUM COVER. SEE SPECIFICATIONS.
14. 3/4" CRUSHED ROCK; 6" DEPTH. EXTEND 6" BEYOND VALVE BOX IN ALL DIRECTIONS.
15. SCHEDULE 80 PVC TEE (SxSxS)
16. 3" PVC SCHEDULE 40 CONDUIT
17. 3" PVC SCHEDULE 40 CONDUIT SWEEP, COUPLED BOTH ENDS
18. 12" FROM HARDSCAPE
19. SAND BACKFILL; 4" ABOVE AND 2" BELOW MAIN LINE
20. PVC SCHEDULE 80 ELBOW, SXS
21. 3" PVC SCHEDULE 40 CONDUIT RISER. INSTALL COUPLERS AT END, CUT 2" ABOVE DRAIN ROCK
22. T.CHRISTY ID TAG MODEL ID-STD-Y2; YELLOW PRINTED WITH CONTROLLER/VALVE NUMBER ON 2 SIDES AND ID.MAX.82-NP012. ATTACH BOTH TAGS TO VALVE STEM USING NYLON CABLE TIE.
23. PVC SCH80 BALL VALVE, SIZE PER VALVE SIZE
24. HEIGHT BELOW GRADE TO ALLOW MIN. 3" CLR FROM VALVE TO BOTTOM OF VALVE BOX LID. USE PVC 45 DEG ELBOWS DOWNSTREAM OF VALVE TO OBTAIN 18" COVER ON LATERALS.
25. HY100 SCREEN FILTER, 100 MESH

4 REMOTE CONTROL DRIP ZONE ASSEMBLY
L4.1



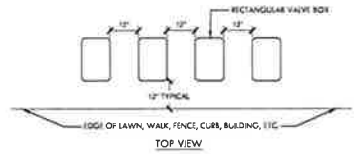
NOTES:
1. INSTALLATION OF TRIPLE SWING JOINTS SHALL BE AT AN ANGLE NO GREATER THAN 45 DEGREES TO HORIZONTAL.
2. ALL PRE-MANUFACTURED TRIPLE SWING JOINTS SHALL BE MANUFACTURED WITH O-RINGS AND SHALL BE RATED AT 200 PSI.

5 POP-UP SPRINKLER
L4.1



NOTES:
1. INSTALLATION OF TRIPLE SWING JOINTS SHALL BE AT AN ANGLE NO GREATER THAN 45 DEGREES TO HORIZONTAL.
2. ALL PRE-MANUFACTURED TRIPLE SWING JOINTS SHALL BE MANUFACTURED WITH O-RINGS AND SHALL BE RATED AT 200 PSI.

6 POP-UP ROTOR
L4.1



NOTES:
1. CENTER VALVE BOX OVER REMOTE CONTROL VALVE TO FACILITATE SERVICING VALVE.
2. SET REMOTE CONTROL VALVE AND VALVE BOX ASSEMBLY IN LEVEL AREA OF PLANTER OR TURF AS SHOWN ON PLAN. NO IRRIGATION BOXES SHALL BE INSTALLED IN CONCRETE, SIDEWALKS, PATHS, ROAD WAYS, ETC.
3. SET VALVE BOXES ON LEVEL BED, 6" DEEP OF 3/4" CRUSHED ROCK. PLACE 1/4" GALVANIZED WIRE MESH DIRECTLY BENEATH VALVE BOX ON TOP OF GRAVEL LEVELING BED.
4. SET BOXES PARALLEL TO EACH OTHER AND PERPENDICULAR TO EDGE OF LAWN, WALK, FENCE, CURB, BUILDING, ETC.
5. AVOID HEAVILY COMPACTING SOIL AROUND VALVE BOXES TO PREVENT COLLAPSE AND DEFORMATION OF VALVE BOX SIDES.
6. INSTALL VALVE BOX EXTENSION BY VALVE BOX MANUFACTURER AS REQUIRED TO COMPLETELY ENCLOSE VALVE ASSEMBLY.
7. SET TOP OF BOX ABOVE SUB-GRADE: 2-1/4" FOR DECOMPOSED GRANITE AREAS; 1-1/2" IN TURF AREAS. SET VALVE BOX HEIGHT TO MATCH GRADE OF ADJACENT HARDSCAPE.
8. VALVE BOXES IN TURF SHALL BE GREEN. VALVE BOXES IN DECOMPOSED GRANITE SHALL BE TAN.
9. GROUP VALVES TOGETHER AS SHOWN ON PLAN AND NOT TO EXCEED 3 VALVE BOXES IN ONE LOCATION. STAKE LOCATION OF VALVES BOXES WITH DIMENSIONS OF AREA REQUIRED FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
10. NO VALVES OR VALVE BOXES SHALL BE INSTALLED WITHIN 5FT (6) FEET OF AN EXISTING OR NEW TREE LOCATION.

7 IRRIGATION BOX LAYOUT
L4.1 — 1/2" = 1'-0"

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PROJECT

SPRUCE PARK RENOVATION

SHEET TITLE

IRRIGATION DETAILS

DATES

NO.	DESCRIPTION	DATE
1.	75% CDs	2022-01-14
2.	100% Review Set	2022-02-24
3.	Final Set	2022-03-08
4.	Park Rename	2022-05-16
5.	"	"
6.	"	"
7.	"	"
8.	"	"

PLOT DATE: "

PROJECT NUMBERS

MELTON DESIGN GROUP: 2436.4
TASK ORDER
CONSULTANT PROJECT #: "

SHEET NUMBER

L4.1

SHEET 8 OF 9

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SECTION 01300

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.
B. Site mobilization meeting.
C. Progress meetings.
D. Construction progress schedule.
E. Submittals for review, information, and project closeout.
F. Number of copies of submittals.
G. Submittal procedures.

1.02 RELATED SECTIONS

A. Project General Conditions.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. The Owner will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. The Owner
   2. Landscape Architect
   4. Contractor
   5. Landscape Contractor
   6. Sub-contractors as requested by the Owner

C. Agenda
   1. Submission of list of Subcontractors, list of Products and schedule of values.
   2. Designation of personnel representing the parties to Contract, The Owner, Contractor, Construction Management firm and Landscape Architect.
   3. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.

4. Critical Path Scheduling.

D. The Landscape Architect will record minutes and distribute copies after meeting to participants.

3.02 SITE MOBILIZATION MEETING

A. The Landscape Architect will schedule a meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor
   2. The Owner
   3. Landscape Architect
   4. Contractor's Superintendent
   5. Major Subcontractors

C. Agenda:
   1. Use of premises by The Owner and Contractor.
   2. The Owner's requirements and occupancy prior to completion.
   3. Permit requirements.
   4. Construction facilities and controls provided by Owner.
   5. Temporary utilities.
   6. Survey and park layout.
   7. Security and housekeeping procedures.
   8. Critical Path Schedules.
   9. Application for payment procedures.
   10. Procedures for testing.
   11. Procedures for maintaining record documents.
   12. Requirements for start-up of equipment.
   13. Inspection and acceptance of equipment put into service during construction period.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum one-week intervals.

B. The Owner will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, the Owner and others, as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.

2. Review of Critical Path Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that may impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Submit updated schedule and critical path items.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Maintenance of quality and work standards.
11. Effect of proposed changes on progress schedule and coordination.
12. Other business relating to Work.

E. The Architect will record minutes and distribute copies after meeting to participants.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. See Contract General Conditions for Schedules Required of Contractor

B. Construction Timeline Priorities – Contract shall coordinate schedule with Owner's prefabricated restroom contractor to have utilities stubbed out and restroom pad ready for restroom contractor to install restroom.

3.05 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.
   5. Ten (10) days before scheduled work, provide mock-up samples onsite for inspection of samples over 50 pounds.

B. Submit to the Landscape Architect for the limited purpose of checking with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 - CLOSEOUT SUBMITTALS.

3.06 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.

2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
6. Other types indicated.

B. Small size sheets, not larger than 8-1/2 x 11; submit the number of copies which the Contractor requires, plus three copies for the Owner, plus one copy for Landscape Architect.

3.07 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. As-built documents.
   5. Other types as indicated.

B. Submit for the Owner's benefit during and after project completion.

3.08 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review: Submit the number of copies which the Contractor requires, plus three copies for the Owner, plus one copy for the Landscape Architect.

   1. Small size sheets, not larger than 8-1/2 x 11 inches: Submit the number of copies the Contractor requires, plus two copies, which will be retained by the Landscape Architect.

   2. Larger Sheets, Not Larger Than 11 x 17 inches: Submit to the Owner the number of opaque reproductions which Contractor requires, plus two copies which will be retained by the Landscape Architect.

B. Documents for Information: Submit two copies.

C. Documents for Project Closeout: Make one copy of submittal originally reviewed.

D. Samples: Submit the number specified in individual specification sections, one of which will be retained by the Landscape Architect.
   1. Retained samples will not be returned to Contractor unless specifically so stated.

3.09 SUBMITTAL PROCEDURES

A. Transmit each submittal with AIA Form G810.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number; and specification section number, as appropriate on each copy.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Submit three (3) copies of each submittal for the landscape architect to retain plus the number of copies the Contractor would like returned for their use.

F. Deliver submittals to the Landscape Architect's business address.

G. Schedule submittals to expedite the Project, and coordinate submission of related items.

H. Make submissions within the following number of days from issuance of Notice to Proceed:
   1. Items needed in initial stages of work, or requiring long lead-time for ordering: 15 days.
   2. All electrical equipment items: 21 calendar days
   3. All other items including all samples: 30 calendar days

I. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

J. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

K. Provide space for Contractor and Landscape Architects review stamps.

L. When revised for resubmission, identify all changes made since previous submission.

M. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any Inability to comply with requirements.

N. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01400

QUALITY REQUIREMENTS

PART1 GENERAL

1.01 SECTION INCLUDES

A. Control of installation.

B. Testing and inspection services.

1.02 RELATED SECTIONS

A. General Conditions

B. Section 01300 Submittals

C. Section 01700 Contract Closeout

D. Individual Specifications Section: Submittals, inspection and testing required, and standards for testing.

1.03 REFERENCES

A. Title 24, California Building Code, current edition.

B. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

1.04 TESTING AND INSPECTION AGENCIES

A. The respective Sections of these specifications contain detailed requirements for materials testing and inspections to be performed by an approved testing laboratory.

B. All costs incurred for testing laboratory services shall be paid for by the Owner. However, should re-testing be required due to contractor's failure to comply with the Contract Document requirements, the Contractor shall pay costs of re-testing.

1.05 OWNER'S RESPONSIBILITIES

A. Owners will select and employ a pre-qualified, independent testing laboratory to perform inspections, sampling and testing of materials as specified in the individual Specifications Section.

B. Owner will pay for all initial testing laboratory services as described within the Contract Document or not normally required by codes and ordinances.

C. When the initial tests indicate non-compliance with the Contract Documents, the costs all subsequent re-testing occasioned by the non-compliance shall be deducted by the Owner from the Contract Sum.

1.06 CONTRACTOR'S RESPONSIBLITIES

A. Cooperate with laboratory personnel, provide access to work, arrange access to manufacturer's operations.

B. Provide laboratory preliminary representative samples of materials to be tested, in required quantities.

C. Furnish copies of mill test reports.

D. Provide casual labor and facilities for access to work being tested; obtain and handle supplies at the site; facilitate inspections and tests; provide facilities for laboratory's exclusive use for storage and curing of test samples.

E. Coordinate requests for testing by Owner-employed testing laboratory through the Owner's Representative. Notify Owner's Representative two (2) working days in advance of operations to allow for assignment of personnel and scheduling of tests.

F. Pay for additional laboratory inspections, sampling and testing required for Contractor's convenience and when initial test indicate that work does not comply with Contract Documents.

G. Pay for inspections and tests required by code or ordinances or by a plan approval authority, and made by legally constituted authority (i.e., municipal deputy inspector), unless otherwise provided for the Contract Documents.

H. When required on individual Specifications Section, submit manufacturer's certificate, executed by responsible officer, certifying that product meet or exceed specified requirements. Provide certification in duplicate.

1.07 TESTING LABORATORY RESPONSIBILITIES

A. Perform specified inspections, sampling and testing of materials and methods of construction, comply with specified standards. Ascertain compliance with requirements of Contract Documents.

B. Provide prompt notification of irregularities or deficiencies of work observed during performance of services.

C. Perform additional inspections and tests required by Owner's Representative.

D. After each inspection and test, promptly submit copies of laboratory report to the Owner. Reports are to include: Date issued, project title and number, name of inspector, date and time of sampling or inspection, identification of product and Specification Section(s), location in the project, type of inspection or test, date of test and results of test, When requested by Owner's Representative provide interpretation of test results.

E. Testing Laboratory shall have no authority to: release, revoke, alter, or enlarge on requirements of Contract Documents; approve, accept or stop any portion of the work; perform any duties of the Contractor.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Field Office.
B. Temporary utilities.
C. Temporary telephone service.
D. Temporary sanitary facilities.
E. Temporary Controls: Barriers and fencing.
F. Security requirements.
G. Waste removal facilities and services.
H. Project identification sign.
I. Dust control.
J. Erosion control
K. Existing Conditions verification.

1.02 RELATED SECTIONS

A. Section 01510 - Temporary Utilities.
B. Section 01550 - Vehicular Access and Parking.
C. County General Conditions Section 10.

1.03 TEMPORARY UTILITIES - See Section 01510

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain portable construction toilet facilities for Contractor's employees and Owner Representatives.

1. Toilet Facilities: Provide sufficient suitably enclosed toilets with urinal for use by all trades engaged on project. The Owner shall approve location.
2. Washing Facilities: Provide properly mounted and adequate wash sinks connected to water supply, in location approved by the Owner.
3. Drinking Water Facilities: Provide clean, sanitary and adequate drinking water.

B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS AND ACCESS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for owner and residents access to their property and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades required by governing authorities for public rights-of-way.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 SECURITY

A. Contractor is responsible for security of areas of his work during the entire time of the Contract. Within this responsibility, the Contractor will repair and/or replace all damages to the work and loss of materials due to vandalism or theft. This includes damages to existing facilities due to construction activities.

1.07 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and the Owner.

B. Provide and maintain access to fire hydrants and the emergency vehicle access and access to adjacent residential housing for the public and the Owner, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

1.08 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Dispose of waste off-site weekly.

1.09 PROJECT IDENTIFICATION SIGN

A. Provide project identification sign to be posted in advance of construction. Provide painted plywood project identification sign, size to be 4' x 6' and must last the duration of the Project. Sign to read: Site Improvements for the Mission Oaks Recreation and Park District, date-to date of construction, construction company name and contact phone number. Design approval of the sign by the Owner and shall be obtained prior to fabrication and construction.

B. Erect on site at location to be approved by the owner.

C. No other signs are allowed without Owner permission except those required by law.

1.10 FIELD OFFICE

Contractor may locate a field office trailer onsite. Size and location of trailer to be approved by Owner prior to placement.

1.11 DUST CONTROL

A. Use water wagons or spray from hoses to control dust created by work operations.
B. Comply with all local and state dust control ordinances.

1.12 EROSION CONTROL

A. Contractor is advised that the State of California has adopted National Pollution Discharge Elimination Requirements in accordance with the requirements of the Clean Water Act. This project is subject to all of the requirements contained in those acts. The contractor shall abide by all of the laws, ordinances, and regulations associated with the NPDES and the Clean Water Act.

B. The SWPPP must be maintained throughout the course of construction and be available at the construction site. The contractor is advised that he shall conform to this requirement and that he shall implement all of the measures required by the SWPPP, including maintenance of diligent record keeping and logs as required by the SWPPP.

C. The contractor shall provide copies of the updated SWPPP to the Owner prior to starting construction operations. The contractor shall provide copies of his SWPPP records and logs during the course of construction, on a monthly basis to the Owner. The contractor shall also keep copies of these records and logs with the SWPPP at the construction site for potential viewing by the State of California Regional Water Quality Control Board.

1.13 EXISTING CONDITIONS VERIFICATION

A. Contractor shall record existing site conditions, either by photographs or video, to provide a record of pre-construction site conditions.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary field office, utilities, equipment, facilities, and materials prior to Final Application for Payment inspection.
B. Remove underground installations to a minimum depth of 2 feet.
C. Clean and repair damage caused by installation or use of temporary work.
D. Unless otherwise directed, restore existing and permanent facilities used during construction to original condition.
E. Maintenance and Removal:
    1. Maintain all temporary facilities and controls as long as needed for safe and proper completion of work. Remove all such temporary facilities and controls as rapidly as progress of work will permit.
    2. Non-compliance with requirements within this section may result in payment being withheld and/or deductive change orders for lack of proper facilities and controls. If necessary, the owner will provide such facilities and controls as required and back charge the Contractor.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Electricity.
B. Temporary Water.

1.02 RELATED SECTIONS

A. Section 01500 - Temporary Facilities and Controls: temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY

A. Cost: By Contractor.
B. It is expected that electrical needs by the Contractor will only require their own generator. If additional electrical services are needed, then the following shall apply;
C. Provide separate electrical source or metering and reimburse the Owner for cost of energy used. Exercise measures to conserve energy.
D. Provide temporary electric feeder from electrical service at location as directed.
E. Complement existing power service capacity and characteristics as required.
F. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
G. Provide main service disconnect and over-current protection at convenient location and meter.
H. Permanent convenience receptacles may be utilized during construction.
I. Provide adequate distribution equipment, wiring, and outlets to provide single-phase branch circuits for power.

1.04 TEMPORARY WATER SERVICE

A. Cost of Water Used: By Contractor. Contractor to pay for water used for on-site work before irrigation system is connected.
B. Contractor to coordinate metering of water use with Owner.
C. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
D. Extend branch piping with outlets located so water is available by hoses with threaded connections.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01550

VEHICULAR ACCESS AND PARKING

PART1 GENERAL

1.01 SECTION INCLUDES

A. Parking.
B. Construction parking controls.
C. Haul routes.

1.02 RELATED SECTIONS

A. Section 01500 TEMPORARY FACILITIES AND CONTROLS

PART 2 – NOT USED

PART 3 EXECUTION

3.01 PARKING

A. Arrange for temporary parking at staging area to accommodate use of construction personnel.
B. Locate as approved by the Owner.

3.02 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

3.03 HAUL ROUTES

A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
B. Confine construction traffic to designated haul routes.
C. Maintain roads in satisfactory condition during the contract time. Repair damages attributable to work of the project at intervals as needed. At completion of Contract, roads and entryways shall be left in condition at least equal to that existing at start of Contract, except as may be otherwise required by Contract Documents.
D. Temporary access reads are to be provided by and completely removed by the Contractor upon completion of work.

END OF SECTION

SECTION 01570

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. This section describes the requirements for the conservation and protection of environmental resources at the work site during and as the result of construction activities, except as otherwise specified. State and federal environmental statutes, rules, regulations, and policies have been enacted to protect environmental resources by ensuring that significant environmental impacts of projects are identified and adequate mitigation measures are incorporated into the project. Environmental protection affects several resource areas, including biological resources, cultural resources, air quality, and water quality. Potential impacts may occur through the generation of noise, dust emissions, discharges of pollutants, disturbances to terrestrial and aquatic areas, additional traffic, creation of traffic obstructions and other threats to public safety, and degradation of resources. Construction activities shall be in accordance with environmental and regulatory permits issued for the project and the Contractor may be held responsible for any violations as prescribed by law. If the Contractor's actions cause infractions that require suspension of work, then the Engineer may, without limiting the District's other rights and remedies, suspend work as specified in Article 13 of the General Conditions.

B. The Contractor shall be responsible for the sequence and control of construction activities, selection and maintenance of equipment, and the conduct of the Contractor's employees at the work site to ensure that specific mitigation measures to reduce or eliminate identified environmental impacts are implemented.

C. Contractor's personnel failing or refusing to carry out requirements of this section in the opinion of the Engineer, shall be removed from the work site if ordered.

D. Construction equipment failing to produce the quality of work within the requirements of this section, in the opinion of the Engineer, shall be removed from the work site if ordered.

E. The Contractor shall minimize construction activities causing disturbances to vegetation, wildlife or cultural resources. Construction activities may be restricted in various ways that include, but are not limited to, the environmental protection and/or mitigation measures specified.

1.02 RELATED SECTIONS

A. Drawings, General Conditions, Supplementary General Conditions, Special Provisions and other Division 1 sections apply to this section. This section may require direct correlation with the following sections of the contract:

1. Section 02260 – Landscape Grading

2. Section 02905 – Landscape Installation

1.03 REFERENCES

A. The following publications form a part of this specification to the extent referenced.
1. The District has obtained the following environmental documents/references and permits:

a. CEQA — California Environmental Quality Act of 1970:

1) ND — Negative Declaration.

2) Notice of Determination.

1.04 SUBMITTALS

A. The Contractor shall develop and submit five detailed plans for implementing the requirements of this section. The plans shall include but not be limited to the following:

1. Name of Contractor's supervisor responsible for implementing the plans.

2. Working drawings and data for implementing the requirements of the plans.

3. Air Quality Control Plan.

4. Water Quality Control Plan and Storm Water Pollution Prevention Plan (SWPPP) (Update existing SWPPP on file with the District).

a. The Storm Water Pollution Prevention Plan (SWPPP) shall be submitted to the Regional Water Quality Control Board (RWQCB) prior to demolition work begins. The SWPPP must be approved by the RWQCB prior to the start of demolition activities.

5. Fire Prevention and Control Plan.

6. Noise Control Plan.

7. Traffic Control Plan.

B. The Contractor shall submit the above plans including working drawings and data to the District for approval five (5) working days prior to mobilization.

C. Copies of all of the above plans shall be maintained at the work site throughout the construction period.

1.05 DELIVERY, STORAGE, AND HANDLING OF HAZARDOUS MATERIALS

A. Construction Sites and Equipment:

1. The storage, transportation, transfer, containment, and disposal of hazardous materials, such as fuel, oil, and lubricants have potential for affecting water quality. Fuel, oil and other petroleum products shall be stored only at designated sites. The use of hazardous materials shall be avoided or minimized where possible. Each hazardous material containment container shall be clearly labeled with its identity, handling and safety instructions, and emergency contact. Similar information shall be clearly available and visible in the storage areas. Storage and transfer of such materials shall not be allowed within 100 feet of streams or sites known to contain sensitive biological resources. Storage or use of hazardous materials in or near wet or dry streams shall be consistent with the Fish and Game Code and other State laws. Material Safety Data Sheets (MSDS) shall be made readily available to the Contractor's employees and other personnel at the work site. The accumulation and temporary storage of hazardous wastes shall not exceed 90 days. Soils contaminated by spills or cleaning wastes shall be contained and shall be removed to an approved disposal site. Disposal of hazardous wastes shall be in compliance with all applicable laws and regulations.

2. Petroleum drippings on equipment have potential to result in water pollution during construction. The Contractor shall maintain construction equipment to minimize petroleum drippings. All stationary power equipment such as engines, pumps, generators, welders, and air compressors shall be positioned over drip pans. Equipment used in water shall be free of exterior petroleum products prior to submersion, and shall be checked and maintained daily to keep the equipment exteriors clean.
3. Petroleum products shall be stored in nonleaking containers at impervious storage sites from which runoff is not permitted to escape.

4. Personnel stationed at or near these sites shall be trained in emergency response and spill containment techniques. An ample supply of absorbent pads, pillows, socks, booms, and other spill containment materials shall be maintained at the hazardous materials storage sites for use in the event of spills. Contaminated absorbent pads, pillows, socks, booms, and other spill containment materials shall be placed in nonleaking sealed container until transport to an appropriate disposal facility. The Contractor shall furnish to the Engineer a contact person and telephony number of a company experienced in emergency response for vacuuming and containing spills of oil or other petroleum products.
5. Fuel may be transferred from the storage areas to construction equipment by tanker trucks. Fuel transfers shall take place at least 100 feet from exclusion zones, drainage areas, water bodies and streams.
6. Fuel transfer vehicles shall have absorbent pads, pillows, socks, booms or other spill containment materials placed under the fueling operation (between the fuel

truck and the equipment being serviced). A trained service attendant shall monitor the filling of equipment and shall stop the fuel flow immediately if any spill occurs. Fuel transfer shall not resume until the problem is resolved to the satisfaction of the Engineer. The service attendant shall be trained in emergency response, fire extinguisher use, and spill containment techniques.

1.06 SENSITIVE SPECIES - NOT USED

1.07 COLLECTION AND HARASSMENT OF SPECIES

A. No intentional harassment, killing, or collection of plants or animals at or around the work site will be allowed.

1.08 BOUNDARIES OF WORK SITE AND LISTED SENSITIVE SPECIES

A. The boundaries of the work site is as shown on the construction drawings for showing exact location of work and areas that may be occupied by the Contractor. The Contractor and the Contractor's employees shall not leave the right of way or temporary construction easement, without prior written approval.

B. Preconstruction surveys will be conducted to designate exclusion zones.

C. Exclusion zones will be marked with either large flagged stakes connected by cord, or survey laths or wooden stakes prominently flagged with survey ribbon or fencing. The Contractor and Contractor's employees shall not encroach into flagged exclusion zones in any manner, whether in vehicles or on foot, without prior written approval.

D. No pets, camping, firearms, or any other use of the right of way area will be allowed. Harassment, killing, or destruction of dens or burrows of wildlife species is strictly prohibited. Contractor's employees shall not be allowed at the work site during nonworking hours. Only authorized camping areas may be utilized. Exceptions that will not cause environmental impacts to biological resources may be allowed by the Engineer.

E. Food-related trash, such as wrappers, cans, bottles, and scraps shall be placed in closed containers and removed daily from work sites. All trash or garbage shall be removed to a city approved disposal site at least weekly by the Contractor. The right of way shall be policed daily by Contractor's personnel and monitored by inspectors or environmental personnel.

F. Traffic shall be restricted to existing roads and flagged right of way or temporary construction easement. Construction related vehicles shall not exceed 25 mph on straight and level roads, with a 10 mph speed limit in areas of steepness or with curves.

1.09 BIOLOGICAL RESOURCES (PLANTS AND ANIMALS)

A. The Construction activities have potential for affecting the biological resources by physical destruction, disturbance, and/or displacement.

B. The Contractor shall not be permitted in areas where sensitive plant species occur until the sensitive plants are removed or soil seed banks are removed by the District.

C. Unless otherwise approved, the Contractor shall not apply any rodenticide or herbicide to control any vertebrate or plant pest.

1.10 CULTURAL RESOURCES

A. See also Special Provisions

B. The construction activities have potential for affecting cultural resources such as historically significant resources, local land uses, commercial establishments, or the activities of local landowners, residents, or recreationalists.

C. The Contractor shall reduce potential adverse impacts to cultural resources that may be associated with construction by implementing the preservation of culturally significant resources in accordance with the National Historic Preservation Act of 1966, (16 U.S.C.470).

D. If any potential paleontological, archaeological or historic sites are uncovered, the Owners Representative will be notified prior to proceeding with the work affected. If necessary the Engineer will suspend work as specified in Article 13 of the General Conditions. The Owners Representative will provide for an initial field evaluation of the site within seventy-two (72) hours after receiving notification of Contractor's discovery.

E. If human remains are exposed, all construction activities shall be halted in the immediate vicinity until the County Coroner has assessed the remains.

1.11 AIR QUALITY CONTROL PLAN

A. See also Special Provisions.

B. The construction activities have potential for resulting in localized, short-term construction emissions from stationary, mobile and area sources, and fugitive dust from construction equipment, and trucks for hauling.

C. The Contractor shall reduce these effects by submitting and implementing an Air Quality Control Plan. The following components, if applicable, shall be included in the plan and if not applicable the Contractor shall explain in the plan why that component or portions thereof is not included in the plan.

D. Fugitive dust shall be minimized by watering, minimizing cleared areas, covering exposed surfaces, seeding, managing activities to keep the active work area small at any given time, applying chemical suppressant or implementing other dust control measures as approved. One or more of the above control measures shall be used sufficiently to prevent fugitive dust from leaving the work site. Increased application of control measures shall be required whenever conditions cause fugitive dust.

E. The Contractor shall control fugitive dust by:
   1. Minimizing areas cleared to facilitate construction, such as storage areas, staging areas, stockpile areas and vehicle parking.
   2. Covering spoil piles when necessary.
   3. Constructing roadways, driveways, sidewalks, building pads and other graded surfaces.
   4. Chipping cleared vegetation and covering exposed areas as work is completed.
   5. Performing seeding requirements as required.
   6. Minimizing the amount of construction equipment operating during any given time period. This includes scheduling of construction truck trips to reduce peak emission, limit the length of the construction workday, and phasing of construction activities.
   7. Covering haul trucks traveling onto or off the work site. Haul trucks traveling on the work site shall be covered as necessary to prevent dust from leaving the work site.

1.12 WATER QUALITY CONTROL PLAN AND STORM WATER POLLUTION PREVENTION PLAN

A. The construction activities have potential for resulting in localized, short-term impacts to water quality due to fuel or oil leaks or spills at fuel or oil transfer areas, erosion and runoff.

B. The Contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for the General Construction Storm Water Permit. Development of the SWPPP shall be accomplished by the Contractor using guidelines provided by the State Water Resources Control Board (SWRCB) for containment of construction activity pollutants such as wastes, erosion, and sediments. The SWPPP shall be submitted to the Regional Water Quality Control Board (RWQCB) five (5) working days prior to field mobilization. The SWPPP must be approved by the RWQCB prior to the start of construction activities. Guidelines for the SWPPP are presented in the Construction Storm Water Permit Package available at the Redding, California, office of the RWQCB. The SWPPP shall include provisions for water quality protection and for implementing Best Management Practices (BMPs) chosen to reduce and mitigate construction activity pollutants. The Contractor shall implement this plan during all construction activities by providing BMPs and conforming to the following provisions.

C. Erosion could potentially cause impacts both on and off the work site. On the work site, erosion could wash away soil and fill material, resulting in the formation of gullies. Off the work site, erosion could result in downstream sedimentation and turbidity impacts. Additionally, the Contractor shall:

   1. Restrict personnel to designated roads.

2. Use methods for controlling erosion on designated roads.
3. Use methods for on-site erosion control and sediment capture methods during construction.

4. Minimize erosion during stormy weather at the work site.
5. Use methods for post construction erosion control.
6. If drainage swales are employed as BMPs, they shall be vegetated or otherwise protected to reduce erosion.

7. Contact personnel and emergency procedures shall be posted at the work site to avoid and minimize loss of property and life in case of a significant storm event.

8. The project Storm Water Pollution Prevention Plan (SWPPP) shall be strictly implemented.

9. All settleable solids, oils, and grease shall be contained to prevent their release into the environment. Flocculents may be used on solids that do not readily settle, as long as they do not contaminate water quality.

10. Excess construction and operation materials, rubble, and excavated soil shall be either reused or disposed of in approved sites. All imported fill shall be obtained from approved sources

11. Exposed areas shall be stabilized with temporary mulching, landscaping, and other erosion control methods during and after land disturbance activities.

12. Areas of disturbance with slopes toward a stream shall be stabilized to reduce erosion potential.

13. Stock piles shall be protected from erosion either by covering them or by placing barriers (e.g. silt fence, sand bags) around their perimeter to prevent the escape of sediments.

14. Spoil disposal areas shall be graded to ensure that drainage from these sites will minimize erosion of spoil materials and adjacent native soil material. Grading shall conform with the existing topography of the area.

D. Streams, Creeks, Drainages or Waterbody Crossings:

1. Berms or other diversion structures may be constructed around the work site to allow uninterrupted flow in streams, creeks or waterbody crossings. Construction shall be separated into two phases to maintain flows through half the waterbody width unless otherwise directed. When the diversion is installed, water shall be directed into siltation basins. If straw bales are used to form the basins, water shall be allowed to settle, filter through the straw, and flow over the natural terrain before returning to the stream. If earth fill is used to form the berm, water shall be allowed to settle, and flow over the

protected berm onto the natural terrain before returning to the stream.

2. Earth moving activities shall not occur in streams, creeks, waterbody crossings, or riparian areas within 24 hours of predicted 50 percent chance of National Weather Service anticipated precipitation during the rainy season (November 15 through April 15). Stockpiled topsoil or backfill shall be stored above the stream high water mark, outside any riparian zone, and not in any area where the stockpiled material could be washed back into the stream. Straw bales or other BMPs shall be used at flowing river or creek crossings at the end of each workday during the rainy season, and at the end of each workday during other seasons when rain is forecast. If a major storm is predicted or occurs outside of the rainy season, straw bales or other BMPs shall be implemented immediately.

3. Any diversion site, siltation basin and other measures shall be inspected during day light hours and after normal working hours during adverse weather conditions for proper operation. Any measure not operating properly or effectively shall be corrected immediately.

1.14 FIRE PREVENTION AND CONTROL PLAN

A. The Contractor shall prepare a fire prevention and control plan in consultation with the Engineer, and responsible fire protection agency(s). The following components, if applicable, shall be included in the plan, and if not applicable the Contractor shall explain in the plan why that component or a portion thereof is not included in the plan:

1. Procedures and policies for controlling any fires including fires that are off the work site, and other related fire prevention and control procedures developed in consultation with resource agencies and fire protection agency(s).

2. No fires will be allowed at the work site. Smoking will be allowed only in areas designated for smoking which shall be cleared of vegetation or in enclosed vehicles.

3. The Contractor shall be responsible for maintaining appropriate fire suppression equipment at the work site. Fire extinguishers, shovels and other fire fighting equipment, shall be inventoried and available at work sites and on construction equipment. Each vehicle on the right of way shall be equipped with a minimum 20 pound (or two 10 pound) fire extinguisher(s) and a minimum of five gallons of water in a fire fighting apparatus (e.g. bladder bag).

4. At the work site, a sealed fire toolbox shall be located at a point accessible in the event of fire. This fire toolbox shall contain: one backpack pump-type extinguisher filled with water, two axes, two McLeod fire tools, and enough shovels so that each employee at the work site can be equipped to fight fire.

5. One or more chainsaws of 3-1/2 or more horsepower with a cutting bar 20 inches in length or longer shall be immediately available at the work site.

6. Gasoline powered construction equipment with catalytic converters shall be equipped with shielding or other acceptable fire prevention features. Internal combustion engines shall be equipped with spark arrestors.

7. Welding sites shall include fire prevention provisions.

8. The Contractor shall maintain contact with local fire fighting agencies throughout the fire season for update on fire conditions and such fire conditions shall be communicated to the Contractor's employees and the Engineer daily.

9. Vehicles are restricted to the work site unless otherwise allowed for fire control procedures.

10. Disturbance to the terrestrial or aquatic environment through the use of heavy construction equipment shall be kept to a minimum. Clearing of vegetation shall occur from the outer boundaries of the work area toward the interior. If a fire should start, the appropriate fire protection agencies responsible shall be contacted immediately. Hand crews, fire fighting water trucks or other fire control measures may be used as a first defense. Only as required, heavy construction equipment shall be utilized to contain the fire or protect a structure from damage.

1.15 NOISE CONTROL PLAN

A. The Contractor shall prepare a Noise Control Plan in consultation with the District and the Engineer. The following components, if applicable, shall be included in the plan. If the components are not applicable, the Contractor shall explain in the plan why the component or portion is not included in the plan.

1. All construction vehicles and equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.
2. Stockpiling and vehicle staging areas shall be sited as far as practical from residences.
3. Hours of construction shall be limited to the hours specified in applicable local noise ordinances.

PART 2 PRODUCTS
NOT USED

PART 3 EXECUTION
NOT USED

PART 4 PAYMENT
NOT USED

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations and procedures.
E. Spare parts and maintenance materials.

1.02 RELATED SECTIONS

A. Section 01400 - Quality Requirements: Product quality monitoring.
B. Section 01300 - Submittal; review, information, procedure and project closeout.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
B. Also see Section 01300 for Submittal requirements.
C. Shop Drawing Submittals: Prepared specifically for this Project.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Provide interchangeable components of the same manufacture for components being replaced.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufactures named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.

B. Deliver to Project site; provide receipts to owner as part of close out documents.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
C. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
D. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Owner will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions.
B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
C. Provide equipment and personnel to handle products by methods to prevent soiling disfigurement or damage.

3.03 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturers' instructions.
B. Store with seals and labels intact and legible.
C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
D. For exterior storage of fabricated products, place on sloped supports above ground.
E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
J. Deliveries of plant materials must be scheduled so that plant materials arrive no more

than five calendar days prior to planting When temperatures exceed 90 degrees F, plants must be stored under shade cloth and watered at least twice each day, as required to maintain plants in a healthy, turgid condition. Wilted and/or otherwise unhealthy plants shall be immediately removed from the job site.

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

B. Related Sections include the following:

1. General Conditions Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
2. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit two copies signed by land surveyor.

E. Final Project Survey: Submit digital copies in AutoCAD and Adobe Acrobat format showing the Work performed and recorded survey data.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

    a. Description of the Work.
    b. List of detrimental conditions, including substrates.
    c. List of unacceptable installation tolerances.
    d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility or Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Owner. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Changes to Work due to Contractors negligence to contact Owner for clarification shall be paid by Contractor.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Owner promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Owner when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by the Owner.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Owner. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Owner before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 8 feet (2.4 m) in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in General Conditions Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. General Conditions "Payments and Completion" section for requirements for Final Completion and Final Payment.
2. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
3. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.

2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover any applicable utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup galvanized painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Landscape Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Landscape Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Landscape Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to General Conditions "Payments and Completion".

2. Submit certified copy of Owner's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Owner. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Landscape Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element, including categories for grading, concrete, fences, walls, irrigation and planting.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Owner Representative
    d. Name of Contractor.
    e. Page number.

1.6 WARRANTIES

A. Submittal Time: Submit written warranties on request of Landscape Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove labels that are not permanent.
g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
h. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
i. Replace parts subject to unusual operating conditions.
j. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Training.

D. Warranties and bonds.

1.02 RELATED SECTIONS

A. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Specific requirements for operation and maintenance data.

C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to the Owner with claim for final Application for Payment.

B. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Melton Design Group will review draft and return one copy with comments.
2. For equipment, or component parts of equipment put into service during construction and operated by the Owner, submit completed documents within ten days after acceptance.
3. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Melton Design Group comments. Revise content of all document sets as required prior to final submission.
4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during

construction with the District's permission, submit documents within ten days after acceptance.

2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by the District.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured horizontal and vertical locations of underground utilities, irrigation and appurtenances, referenced to two permanent surface improvements.
2. Field changes of dimension and detail.
3. Details not on original Contract drawings.

3.02OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to dearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and any special operating instructions.

C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

D. Provide servicing and lubrication schedule, and list of lubricants required.

E. Include manufacturer's printed operation and maintenance instructions.

F. Include sequence of operation by controls manufacturer.

G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

H. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

C. Binders: Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data on 24-pound paper.
Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.06 TRAINING

A. Provide training and orientation of District's operating staff in proper care and operation of equipment, systems and controls.

B. Submit three copies of certificate, signed by District's Representative, attesting to their having been instructed.

3.07 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with the District's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

SECTION 01781

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:
1. Division 1 Section "Closeout Procedures" for general closeout procedures.
2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 2 through 16 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up Record Prints.

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one copy of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Locations of concealed internal utilities.
    i. Changes made by Change Order or Construction Work Change Directive.
    j. Changes made following Landscape Architect's written orders.
    k. Details not on the original Contract Drawings.
    l. Field records for variable and concealed conditions.
    m. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Construction Inspector. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.

1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Owner for resolution.
3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Owner's reference during normal working hours.

END OF SECTION

SECTION 01782

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, and finishes systems and equipment.

B. Related Sections include the following:

1. Division 1 Section "Administrative Requirements" for submitting copies of submittals for operation and maintenance manuals.
2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Divisions 2 through 16 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS

A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Landscape Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit one copy of each manual in final form at least 15 days before final inspection. Landscape Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Landscape Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Landscape Architect's comments.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with

same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Landscape Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related

components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

   1. Fire.
   2. Flood.
   3. Gas leak.
   4. Water leak.
   5. Power failure.
   6. Water outage.
   7. System, subsystem, or equipment failure.
   8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.

3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.

2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate

references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

G. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 02100

DEMOLITION

PART 1 GENERAL

1.01 DESCRIPTION

A. Work includes, but is not limited to the following:

1. The Contractor shall provide all equipment, tools, fmaterials, and labor necessary to complete the Work.

2. Completely coordinate with Work of all other trades.

3. Provide protection for all existing objects or conditions designated on the Drawings to remain on the site or return to the Owner.

4. Provide protection to prevent injury or damage to persons or adjacent properties.

5. Remove and dispose of demolished materials from the site as indicated on the drawings.

6. Comply with applicable codes and ordinances concerning demolition operations.

B. Definition: The term "demolition", as used herein, includes the removal and disposal of all existing objects (except for those objects designated to remain) down to the existing grade level or subgrade level to the extent indicated or as otherwise required to permit new construction and all other Work as described in this Section necessary to complete all Demolition Work.

C. Use of explosives will not be permitted.

1.02 PERMITS, ORDINANCES, ETC.

Procure and pay for all necessary permits or certificates required to complete the Demolition Work specified. Make any and all required notifications and comply with all applicable Federal, State, and Local ordinances concerning demolition operations.

1.03 JOB CONDITIONS

Visit the site and examine the existing conditions and observe the conditions under which the Work is to be performed. Notify the Landscape Architect of unsatisfactory conditions and do not proceed with the Work until unsatisfactory conditions have been

corrected in a manner acceptable to the Landscape Architect. Note all conditions as to character and extent of Work involved.

1.04 PROTECTION

A. Execute all Demolition Work in an orderly and careful manner with due consideration for any existing condition designated to remain. Provide protection to preserve existing items indicated to remain and to prevent injury or damage to persons or adjacent properties.

B. Use all means necessary to protect existing conditions designated to remain and adjacent properties. Avoid any encroachment on adjacent properties. In the event of damage or loss to any existing condition designated to remain or adjacent properties, immediately make all repairs and replacements necessary to the approval of the Owner at no additional cost to Owner.

C. Do not interfere with the normal traffic on roads, streets, walks, or use of adjacent properties. Provide alternate routes around closed or obstructed traffic ways as required by governing regulations.

D. Protect existing trees per plans.

1.05 CUTTING AND PATCHING

Cut existing sidewalks, roads, and curbs as required to complete Demolition Work. Pavement shall be cut vertically along straight lines forming the edges of the Demolition Work and so as not to damage the adjacent pavement. Repair all pavement as specified in Sections of the specification covering the applicable trades.

1.06 DUST CONTROL

Use all means necessary to prevent the spread of dust during performance of the Work of this Section; thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the site.

PART 2 - PRODUCTS

2.01 OTHER MATERIALS

All other materials, not specifically described but required for proper completion of the Work of this Section, shall be as selected by the Contractor subject to approval by the Landscape Architect.

PART 3 - EXECUTION

3.01 PREPARATION

A. Notification

Notify the Landscape Architect at lease two (2) full working days prior to commencing the Work of this Section.

B. Site Observation

1. Prior to all Work of this Section, carefully observe the entire site for all objects designated to be removed and to be preserved.

2. Contact the Underground Service Alert (U.S.A.) at 1-800-227-2600 to stake and mark the location of all existing utilities prior to the beginning of Work.

3. Locate all existing utility lines indicated on the Drawings to remain, and determine the requirements for their protection.

4. Locate, if any, all existing utility line indicated on the Drawings to be disconnected and capped, and determine all requirements for disconnecting and capping.

C. Clarification

1. The Drawings do not purport to show all objects existing on the site.

2. Before commencing the Work of this Section, verify with the Landscape Architect all objects to be removed and all objects to preserve.

D. Scheduling

1. Schedule all Work in a careful manner with all necessary consideration for adjacent properties and the general public.

2. Avoid interference with the use of, and passage to and from, adjacent properties.

3. Conduct operations so as not to interfere with the use of adjacent roads, streets, drives, walks, service lines, etc.

E. Disconnection of Utilities

Before starting site construction, arrange for the disconnection of all utility lines designated to be removed, relocated, or capped with the appropriate utility company. Utility company services for this Work shall be paid for by the Contractor.

F. Protection of Utilities

Retain and protect in operating condition all active utilities traversing the site designated to remain.

3.02 DEMOLITION OF OBJECTS

A. Remove and dispose of all existing objects (except for those objects designated to remain) down to existing grade level or subgrade level to the extent indicated or as otherwise required to permit new construction.
B. Tree Demolition – remove all of tree, tree trunk and roots, including below grade.

3.03 REQUIREMENTS FOR REMOVAL OF ASPHALT AND CONCRETE PAVEMENT

A. Remove asphalt pavement to neatly saw edges. Make saw cuts to a minimum dept of one (1) inch below the bottom surface of the pavement. Where only the surface of existing asphalt pavement is to be removed, obtain approval of method from the Landscape Architect, and provide a minimum laying depth of one (1) inch of new pavement material at the join line. Where asphalt pavement adjoins a trench, trim the edges adjacent to the trench to neat straight lines before resurfacing to insure that all areas to be resurfaced are accessible to the rollers used to compact the subgrade or paving materials.

B. Remove concrete pavement to neatly sawed edges. Make saw cuts a minimum depth of one (1) inch below the bottom surface of the pavement. If a saw cut in concrete pavement falls within three (3) feet of an expansion joint, construction joint, cold joint or edge, move the concrete to the joint or edge. The edges of existing concrete pavement adjacent to trenches, where damaged subsequent to saw cutting of the pavement, saw cut again to neat straight lines for the purpose of removing the damaged pavement areas. Such saw cuts shall be either parallel to the original saw cuts or shall be cut on an angle which departs from the original saw cut not more than one (1) inch in each six (6) inches.

C. Concrete curbs, gutters, cross gutters, driveways and walks: Remove concrete to neatly sawed edges, with saw cuts made to a minimum depth of one and one-half (I -1 /2) inches. Concrete sidewalk of driveway to be removed shall be neatly sawed in straight lines, either parallel to the curb or at right angles to the alignment of the sidewalk. No section to be replaced shall be smaller than thirty (30) inches in either length or width. If the saw cut in sidewalk or driveway fall

within thirty (30) inches of a construction joint, expansion joint, cold joint or edge, the concrete shall be removed to the joint or edge, except that where the saw cut would fall within twelve (12) inches of a score mark, the saw cut shall be made in and along the score mark. Curb and gutter shall be sawed to a depth of one (1) inch below the bottom surface in a neat line at right angles to the curb face.

3.04 BACKFILL AND COMPACTION

All excavations left by the Demolition Work shall be filled and compacted to make the surface at these points conform in contour and density to that of the surrounding ground, and as specified per plan and these special provisions.

3.05 DISPOSAL OF DEBRIS

A. All material removed under this Contract, which is not to be salvaged or reused, or otherwise specified on the Plan shall become the property of the Contractor and be promptly disposed of. It shall be the responsibility of the Contractor to procure dumping facilities or other means of disposal for all items specified to be removed from the site. Storing or permitting refuse to accumulate on the site will not be permitted.

B. Disposal of all materials from the site shall be done in a lawful manner. Transport all refuse materials from the site without spilling on the streets.

C. Burning of refuse material on the site will not be permitted.

END OF SECTION

SECTION 02230

SITE CLEARING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, equipment and services necessary to provide all work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section includes, but is not limited to the following:

1. Site preparation.
2. Tree protection.
3. Restore damaged improvements to original condition.
4. Existing Utilities.
5. Clearing and Grubbing.
6. Removing topsoil.
7. Removing existing improvements.
8. Backfill requirements.
9. Disposing of objectionable material.

B. Related Work Specified in Other Sections

1. SECTION 02300 – EARTHWORK.

C. Related Documents

3. Section 31 1000 – Site Clearing.

D. Definitions

1. ANSI: American National Standards Institute.

2. CAL-OSHA: California Occupational Safety and Health Administration.

3. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2-inches in diameter; and free of weeds, roots, and other deleterious materials.

1.02 SUBMITTALS

A. Follow Submittal procedure outlined in Section 01330 – Submittal Procedures.

B. Project Record Documents: Record actual locations of pipe mains, valve, connections and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.03 QUALITY ASSURANCE

A. Do not remove or prune trees without written approval from Owner.

B. Prune to the standards of the International Society of Arborists and to ANSI 300.

1.04 PROJECT CONDITIONS

A. Except for materials indicated to be stockpiled or to remain the Owner's property, cleared materials are the Contractor's property. Remove cleared materials from site and dispose of in lawful manner.

B. Unidentified Materials; if unidentified materials are discovered, including hazardous materials that will require additional removal other than is required by the Contract Documents, immediately report the discovery to the Owner.

C. If necessary, the Owner will arrange for any testing or analysis of the discovered materials and will provide instructions regarding the removal and disposal of the unidentified materials.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Backfill excavations resulting from demolition operations with on-site or import materials conforming to structural backfill defined in Section 02300 – Earthwork.

PART 3 EXECUTION

3.01 SITE PREPARATION

A. Protect and maintain benchmarks and survey control points during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain during construction.

D. Verify existing conditions at the site and include all work evident by site inspection whether or not shown on the Drawings.

3.02 TREE PROTECTION

A. Erect and maintain temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

B. Do not store construction materials, debris, or excavated material within drip line of remaining trees.

C. Do not permit vehicles or equipment within drip line of remaining trees.

D. Do not excavate within drip line of remaining trees, unless otherwise indicated.

E. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation edge as possible.

1. Cover exposed roots with burlap and water regularly.

2. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3. Coat cut faces of roots more than 1-1/2-inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.

4. Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.

F. Also see Tree Protection requirements outlined on Construction Drawings.

3.03 RESTORATION

A. Restore damaged improvements to their original condition, as acceptable to the Owner.

B. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, as directed by the Owner.

1. Employ a qualified, licensed arborist, to submit details of proposed repairs and to repair damage to trees and shrubs.

2. Replace trees that cannot be repaired and restored to full-growth status, as

determined by the Owner.

3.04 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed or abandoned.

B. Arrange to shut off indicated utilities with utility companies or verify that utilities have been shut off.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless authorized in writing by the Owner, and then only after arranging to provide temporary utility services according to requirements indicated.

D. Coordinate utility interruptions with utility company affected.

E. Do not proceed with utility interruptions without the permission of the Owner and utility company affected. Notify Owner and utility company affected two working days prior to utility interruptions.

F. Excavate and remove underground utilities that are indicated to be removed.

G. Securely close ends of abandoned piping with tight fitting plug or wall of concrete minimum 6-inches thick.

3.05 CLEARING AND GRUBBING

A. Clear the site and remove obstructions, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

B. Remove trash, debris, logs, concrete, masonry and other waste materials.

C. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

D. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18-inches below subgrade.

E. Use only hand methods for grubbing within drip line of remaining trees.

F. In areas not to be further excavated, fill depressions resulting from site clearing. Place and compact satisfactory soil materials per the geotechnical investigation report.

G. Clear undergrowth and deadwood without disturbing subsoil.

3.06 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Remove trash, debris, weeds, roots, and other waste materials.

D. Stockpile topsoil materials designated to remain on site at a location approved by the Owner at a location away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

E. Do not stockpile topsoil within drip line of remaining trees.

3.07 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, and gutters, as indicated. Where concrete slabs, curb, gutter and asphalt pavements are designated to be removed, remove bases and subbase to surface of underlying, undisturbed soil.

C. Unless the existing full-depth joints coincide with line of pavement demolition, neatly saw-cut to full depth the length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

D. Remove driveways, curbs, gutters and sidewalks by saw cutting to full depth. If saw cut falls within 30-inches of a construction joint, expansions joint, score mark or edge, remove material to joint, mark or edge.

3.08 BACKFILL

A. Place and compact material in excavations and depressions remaining after site clearing in conformance with Section 02300 – Earthwork.

3.09 DISPOSAL

A. Remove surplus unsuitable soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the Owner's property.

END OF SECTION

SECTION 02260

LANDSCAPE GRADING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all labor, materials services and equipment indicated on Drawings and/or herein specified to complete all Landscape Grading Work

B. Landscape grading shall consist of importing topsoil to cap turf areas, importing top soil to create landscape berming, importing top soil for tree hole back fill, ripping, establishing finish grade to conform to the contours, grades, line and shapes of rough grades established on Engineer's plans. Work may also include loosening of compacted soils created during the course of construction.

C. Land alteration of existing topographic conditions to conform to the contours, grades, lines and shapes indicated on Engineer's and the Owner's plans.

D. Contractor shall furnish, place and settle all required backfill material to conform to the contours, grades, lines and shapes as indicated on the Drawings, and engineer's plans

1.02 RELATED WORK

A. SECTION 02905 - LANDSCAPE INSTALLATION

1.03 DEFINITIONS

A. Finish grade: Finish grade: Finish grade shall mean the establishment of grades to .04 feet plus or minus.

B. Grading intent: Spot elevations (grades) and contours are indicated based on the best available data. Landscape Architect's Drawings are referenced to provide site grading data. The intent is to maintain constant slopes between spot elevations. If a spot elevation is determined to be in error, or the difference in elevation between points change contact the Owner immediately for field adjustments of spot elevations.

1.04 JOB CONDITIONS

A. Visit the project site and examine the existing conditions under which the Work is to be performed. Note all conditions, as to character and extent of Work involved. This may include pot holing to determine depth of bedrock

1.05 EXISTING UTILITIES

A. Contractor is responsible to contact U.S.A (800-642-2444) to stake and mark the location of all existing utilities before commencing Work. Pot hole as required to determine and verify location and depth.

B. Retain and protect in operating condition all active utilities traversing the site designated to remain.

1.06 PROTECTION OF EXISTING CONDITIONS and ADJACENT PROPERTIES

A. Use all means necessary to protect existing conditions designated to remain, newly constructed conditions and adjacent properties. Avoid any encroachment on adjacent properties.

B. Prevent damage to existing bench marks, pavement, utility lines. In the event of damage or loss immediately make all repairs and replacements required to the Owner's approval at no additional cost to the Owner.

1.07 QUALITY ASSURANCE

A. Finish grade shall conform to contours, grades, lines and shapes, as indicated on Landscape Architect's Drawings, with uniform slopes between finish grades or between finish grades and existing grades.

B. Establish finish landscape grades in a continuous, uniform line, resulting in a uniform surface with no ridges, birdbaths or low spots.

C. Finish landscape grade tolerance shall be .04 feet plus or minus of final grades indicated on Drawings.

D. Slope grade away from buildings a minimum of two (2) percent in five (5) feet horizontal distance unless otherwise indicated on Drawings, or Landscape Architect's plans.

1.08 SUBMITTALS

A. Provide one (1) cubic foot sample of import topsoil material for the Owner's approval prior to delivery to the site, but in any case, prior to placement.

B. Provide horticultural soils report of existing landscape soil after rough grade and submitted topsoil including information on soil texture, filtration rate, nutrient levels and organic matter. Include recommendation for amendment to be added to existing landscape soil and topsoil to mitigate any deficiencies.

PART 2 - PRODUCTS

2.01 ONSITE MATERIAL

A. Existing onsite excavated surplus material may be acceptable fill or top soil material, if approved by the Owner or Owner's representative and upon submittal of a horticultural soils report and possible amending of existing soil to match criteria specified in this section for import top soil. Excavated surplus material not required for fill material or top soil shall be removed and legally disposed of off site.

2.02 IMPORTED TOPSOIL MATERIAL

A. Imported topsoil material shall be of friable sandy-loam texture free of refuse, roots, heavy or stiff clays, rocks over 1" in diameter , 15% by volume rock between 1/8" and 1", sticks, other deleterious matter.

B. Imported topsoil acidity range (Ph) shall be between 6.5 to 7.5, containing a minimum of 4% and a maximum of 25% organic matter.

C. Imported topsoil shall be free of all noxious weeds and other seeds.

D. Imported topsoil shall be amended as per soils report (refer to paragraph 1.08 B), at no additional cost to the Owner.

E. Topsoil shall be stock piled on site in an area free of rock and other deleterious materials. Owner reserves the right to reject topsoil once placed in proper location per Part 3 if deleterious materials mixed in to topsoil.

PART 3 - EXECUTION

3.01 GENERAL

A. Conduct work in an orderly manner. Dirt shall not be permitted to accumulate on streets or sidewalks nor to be washed into storm drains.

B. Use all means required to prevent the erosion of freshly graded areas during construction and until such a time as proposed hard surfaces and landscaping have been constructed.

C. Excess on site material after material has been used to bring site to finished grade shall be removed and legally disposed of off site.

D. If there is not enough site material to bring site to grade, contractor shall import topsoil.

3.02 RIPPING

A. If, during the course of construction, landscape areas become compacted to greater than 90% relative density, landscape areas with the exception of areas beneath the canopies of existing trees shall be ripped and cross ripped to a depth of 12".

B. Rip and cross rip to a depth of 6 inches all areas exposed by engineering cut operations. Remove all rock one inch or larger within 6 inches of finish grades in all non-hydro mulch planted areas.

C. Rip and cross rip to a depth of 6 inches all turf areas prior to the placement of import topsoil.

3.03 TOP SOIL PLACEMENT

A. Place topsoil to contours indicated on plans to create landscape berming.

B. Place topsoil in any way as indicated on plans

C. If insufficient on site soil is available, then contractor shall supply import topsoil.

3.04 FINISH LANDSCAPE GRADING

A. Finish grade shall conform, after settling, to shapes, spot elevations and contours as indicated on Landscape Architect's Drawings, with uniform levels or slopes between finish elevations or between finish elevations and existing elevations.

B. Fine grade all planting areas to a smooth, loose and uniform surface. Remove all extraneous matter 1" or larger in size and dispose of off site to create a smooth surface. Finish grades shall slope to drain, without water pockets or irregularities (humps or hollows). Grades shall be or uniform slope between points of fixed elevation establishing vertical curves or roundings at abrupt changes in slope.

C. Shrub/ground cover planting areas shall be graded two and one-half (4-1/2) inches below adjacent paved areas, sidewalks, valve boxes, headers, drains, etc. in order to receive two (4) inch depth of mulch, establishing final grade one-half (1/2) inches below these surfaces.

D. Turf areas shall be graded one and one half (1-1/2) inches below adjacent paved areas, sidewalks, valve boxes, headers, drains, etc. in order to receive sod.

3.05 FINISH LANDSCAPE GRADING OBSERVATION

A. Soil preparation: comply with SECTION 02905 - LANDSCAPE INSTALLATION prior to finish grading operations

B. Finish grade shall conform, after compaction, to shapes, spot elevations and contours as indicated on Drawings, with uniform levels or slopes between finish elevations or between finish elevations and existing elevations.

C. The Contractor is responsible to spread excess excavated soil material from plant pits in surrounding planting beds.

D. Fine grade topsoil in all planting areas eliminating rough and low areas to insure positive drainage, to a smooth, loose and uniform surface. Maintain levels, profiles and contours of sub-grades.

E. Remove stones, roots, grass, weeds, debris and other foreign material while spreading, in excess of one inch in diameter.

F. Shrub/ground cover planting areas shall be graded two and one-half (4-1/2) inches below adjacent paved areas, sidewalks, valve boxes, headers, drains, etc. in order to receive two (4) inch depth of mulch, establishing final grade one-half (1/2) inches below these surfaces

END OF SECTION

SECTION 02300

EARTHWORK

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, equipment, and services necessary to provide all work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section includes, but is not limited to the following:

1. Rough Grading of site, Excavating, backfilling and grading, as required to obtain contours and elevations indicated on the Drawings.
2. Subgrade preparation.
3. Compaction and Testing.
4. Protection.
5. Disposal.

B. Related Work Specified in Other Sections

1. SECTION 02230 – SITE CLEARING
2. SECTION 02324 – TRENCHING
3. SECTION 02741 – ASPHALTIC CONCRETE PAVEMENT
4. SECTION 02770 – CURBS AND GUTTERS

C. Related Documents

1. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 1997.
2. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2000a.
3. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.

4. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2000.
5. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994.
6. ASTM D 2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregates; 1995.
7. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1996.
8. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1996.
9. Geotechnical Investigation for site is the responsibility of Contractor.

D. Definitions

1. Borrow: Approved soil material imported from off-site for use as Structural Fill or Backfill.
2. Excavation: Removal of material encountered above subgrade elevations.
   a. Authorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions as shown on plans or authorized by the Owner's Representative.
   b. Unauthorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions without authorization by the Owner's Representative. Unauthorized excavation shall be without additional compensation.
4. Structural Backfill: Soil materials approved by the Owner's Representative and used to fill excavations resulting from removal of existing below grade facilities, including trees. See Section 02324 – Trenching for trench backfill.
5. Structural Fill: Soil materials approved by the Owner's Representative and used to raise existing grades.
6. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material ¾-cubic yards or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2-inches.

7. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.

8. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.

9. Unsuitable Material: Any soil material that is not suitable for a specific use on the Project. The Owner's Representative will determine if a soil material is unsuitable.

10. Utilities: underground pipes, conduits, ducts and cables.

1.02 SUBMITTALS

A. Follow submittal procedures outlined in Section 01330 – SUBMITTAL

PROCEDURES.

B. Submit material certificates signed by the material producer and the Contractor, certifying that each material item complies with, or exceeds the specified requirements.

C. Project Record Documents: Record actual locations of pipe mains, valves, connections, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.03 QUALITY ASSURANCE

A. Testing and Inspection Service (Owner's Representative) shall provide soil testing and inspection services for quality assurance testing during earthwork operations.

B. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

C. Perform excavation, filling, compaction and related earthwork under the observation of the Owner's Representative. Materials placed without approval of the Owner's Representative will be presumed to be defective and, at the discretion of the Owner's Representative, shall be removed and replaced at no cost to the Owner. Notify the Owner's Representative at least 24-hours prior to commencement of earthwork and at least 48 hours prior to testing.

D. The Owner's Representative will perform observations and tests required to enable him to form an opinion of the acceptability of the Project earthwork. Correct earthwork that, in the opinion of the Owner's Representative, does not meet the requirements of these

Technical Specifications.

E. Upon completion of the construction work, certify that all compacted fills and foundations are in place at the correct locations, and have been constructed in accordance with sound construction practice. In addition, certify that the materials used are of the types, quality and quantity required by these Technical Specifications. The Contractor shall be responsible for the stability of all fills and backfills constructed by his forces and shall replace portions that in the opinion of the Owner's Representative have been displaced or are otherwise unsatisfactory due to the Contractor's operations.

F. Finish soil grade tolerance at completion of grading:

1. Top surface of finish grade (unpaved areas): ±0.05 feet

1.04 PROJECT CONDITIONS

A. The Contractor shall assess and evaluate all site conditions and layout the work before any earthwork shall begin.

B. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

C. Protect wetland (including setback area) as shown on the plans and as directed by the Environmental Consultant.

D. Prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

E. Temporarily stockpile fill material in an orderly and safe manner and in a location approved by the Owner.

F. Provide dust and noise control in conformance with Division 1 General Requirements.

G. Environmental Requirements: When unfavorable weather conditions necessitate interrupting earthwork operation, areas shall be prepared by compaction of surface and grading to avoid collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, compaction specified in last layer shall be re-established before resuming work.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from on-site excavations.

B. Obtain approval of on-site soil materials and borrow materials to be used for structural fill or structural backfill from the Owner's Representative.

C. On-Site Structural Fill and Structural Backfill: per the County of Yuba Construction Specifications and Geotechnical Investigation.

D. Imported Structural Fill and Structural Backfill: per the County of Yuba Construction Specifications and Geotechnical Investigation.

PART 3 EXECUTION

3.01 GENERAL

A. Conform to Specifications as modified by the Contract Documents and the Geotechnical Investigation.

B. Surfaces to receive fill and soils to be compacted shall be free of standing water, and shall not be saturated with water.

C. Do not use explosives.

D. In asphalt concrete paved areas, neatly saw cut pavement a minimum of 24 inches beyond the limits of excavations. If edge of pavement is located within 30 inches of limit of excavation, remove pavement to existing edge.

E. Complete clearing and stripping as indicated on Drawings and in accordance with Section 02230 Site Clearing.

F. Remove existing utility lines that traverse the site as indicated on Drawings and in accordance with Section 02230 Site Clearing.

G. Scarify the upper 6 inches of the exposed subgrade-to-receive fill. The loosened soils should be uniformly moisture conditioned to one to three percent over optimum and compacted to 90 ± 2 percent relative compaction per ASTM D 1557. Compact to 95 percent in uppermost six inches of soil subgrade in pavement areas.

3.02 CONTROL OF WATER AND DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area. Provide dewatering equipment necessary to drain and keep excavations and site free from water.

B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.

C. Obtain the Owner's Representative's approval for proposed control of water and dewatering methods.

D. Protect subgrades from softening, undermining, washout and damage by rain or water accumulation.

E. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.

F. Maintain dewatering system in place until dewatering is no longer required.

3.03 WET WEATHER CONDITIONS

A. Do not prepare subgrade, place or compact soil materials if above moisture content indicated on the Geotechnical Investigation.

B. If the Owner's Representative allows work to continue during wet weather conditions, conform to supplemental recommendations provided by the Owner's Representative.

3.04 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Owner's Representative, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Owner.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.05 EXCAVATION

A. Excavate earth and rock to lines and grades shown on drawings and to the neat dimensions indicated on the Plans, required herein or as required to satisfactorily compact backfill.

B. Remove and dispose of large rocks, pieces of concrete and other obstructions encountered during excavation.

C. Where forming is required, excavate only as much material as necessary to permit

placing and removing forms.

D. Provide supports, shoring and sheet piles required to support the sides of excavations or for protection of adjacent existing improvements.

E. Excavate by hand or vacuum within drip-line of trees to remain. Do not damage trees or roots. Prevent dehydration of exposed roots. Refer to Section 02230 Site Clearing for additional tree protection requirements.

F. Replace the excavated material or any approved supplementary import material in lifts not to exceed 8 inches in loose thickness and compact per the Geotechnical Investigation.

3.06 REMOVAL OF EXISTING FILLS AND UNSUITABLE MATERIAL

A. Over-excavate areas of existing fills and other unsuitable material encountered during mass grading as directed by the Owner's Representative.

B. Compensation for increased removal widths and depths that are not required by the Owner's Representative will not be considered, except when such increase is necessary for protection of life and property as determined by and approved by the Owner.

C. The Owner's Representative will provide written approval for each excavation prior to placement of fill. Allow adequate time after excavation and before filling for the Owner's Representative's review and written approval and, if necessary, time for the Owner to conduct as built survey prior to placing fill. Basis for calculating the quantity of material excavated or placed may be the difference between the grading shown on the Plan and an as built survey of the grading.

3.07 GRADING

A. Provide smooth finished surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated on Drawings, or between such points and existing grades.

B. Finish ditches, gutters and swales to the sections, lines and grades indicated and to permit proper surface drainage.

C. Round tops and bottoms of slopes as indicated or to blend with existing contours.

3.08 SUBGRADE PREPARATION

A. Install underground utilities and service connections prior to final preparation of subgrade and placement of base materials for final surface facilities. Extend services so that final surface facilities are not disturbed when service connections are made.

B. Prepare subgrades under paved areas, curbs, gutters, walks, structures, other surface

facilities and areas to receive structural fill.

C. Prepare subgrades for paved areas, curbs and gutters by plowing or scarifying surface at least 6 inches below final subgrade elevations and 5-feet beyond edge of pavement unless specified otherwise by the Owner's Representative. Uniformly moisture condition to one to three percent over optimum moisture contents. Break clods and condition surface by harrowing or dry rolling. Remove boulders, hard ribs and solid rock. Prepare earth uniform for full depth and width of subgrade.

D. Protect utilities from damage during compaction of subgrades and until placement of final pavements or other surface facilities.

E. Obtain the Owner's Representative's approval of subgrades prior to placing pavement.

3.09 PLACEMENT OF STRUCTURAL FILL

A. Obtain the Owner's Representative's approval of surface to receive structural fill prior to placement of structural fill material.

B. Place structural fill on prepared subgrade.

C. Spread structural fill material in uniform lifts not more than 8-inches in un-compacted thickness and compact.

D. Place structural fill material to suitable elevations above grade to provide for anticipated settlement and shrinkage.

E. Overbuild fill slopes, as required by the Owner's Representative, to obtain required compaction. Remove excess material to lines and grades indicated.

F. Do not drop fill on structures. Do not backfill around, against or upon concrete or masonry structures until structure has attained sufficient strength to withstand loads imposed and the horizontal structural system had been installed.

3.10 COMPACTION AND TESTING

A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification as indicated below.

B. Percentage of Maximum Density Requirements: Compact soil to no less than the following percentages of maximum density in accordance with ASTM D 1557.

2. Lawn or Planter Areas: Compact top 6 inches of subgrade and each layer of backfill or fill material at 85 ± 2 percent relative compaction.

3. Vehicular pavements: Compact top 12 inches of subgrade and each layer of backfill or fill material at 90 ± 2 percent relative compaction. The upper 6 inches of pavement subgrade soils shall be compacted to at least 95 percent relative

compaction.

C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

1. Remove and replace or scarify and air dry soil material that is too wet to permit compaction to specified density.

2. Soil material that has been removed because it is too wet to permit compaction 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.

D. Compact soils at water content specified in the Geotechnical Investigation. Aerate material if it is too wet. Add water to material if it is too dry. Thoroughly mix lifts before compaction to ensure uniform moisture distribution.

E. Perform compaction using rollers, pneumatic or vibratory compactors or other equipment and mechanical methods approved by the Owner's Representative.

3.11 PROTECTION

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

C. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

D. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.12 DISPOSAL

A. Stockpile suitable excess soil material per the Drawings and as directed by the Owner.

B. Lawfully dispose of all unsuitable excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 02316

FILL AND BACKFILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling and compacting for concrete paving and rigid concrete pavements subject to traffic loadings.
B. Backfilling and compacting for utilities to utility main connections.

1.02 RELATED SECTIONS

A. General Conditions and Special Provisions for Air and Water Pollution Control and Dust Control
B. Section 02260 – Landscape Grading
C. Section 02515 – Site Concrete
D. Section 02811 – Irrigation: Trenching and Backfill

1.03 REFERENCES

A. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 1996a.
B. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN mlm3)); 1991 (Reapproved 1998).
C. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System); 1998.
D. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1996.
E. ASTM D 2974 - Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils; 1996.
E. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1996.
F. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 1998.

1.04 PROJECT CONDITIONS

A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
B. Verify that survey benchmarks and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. Engineered Fill: Subsoil excavated on-site.
   1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   2. Conforming to ASTM D 2487 Group Symbol CL, ML, SM, SP.

B. Engineered Fill: Imported borrow.
   1. Graded in accordance with ASTM C 136, within the following limits:
      a. 3 inch sieve: 100 percent passing.
      b. 3/4 inch sieve: 70 to 100 percent passing.
      c. No. 4 sieve: 50 to 100 percent passing.
      d. 40 sieve: 30 to 100 percent passing.
      e. 50: 30 to 100 percent passing.
      f. No. 200: 30 to 70 percent passing.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   3. Conforming to ASTM D 2487 Group Symbol CL, ML, SM, SP.
   4. Liquid limit < 30. Plasticity Index < 12.
   5. Organic content less than 3%.
   6. Expansion potential (UBC 18-2) less than 20.
   7. Maximum Dry Density more than 105 pcf.

C. Topsoil: See Section 02260.

D. Class 2 Aggregate Base: See Section 02721Aggregate Base Course.

2.02 SOURCE QUALITY CONTROL

A. Where import fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 02260 for additional requirements.

3.02 PREPARATION

A. Scarify all areas to receive engineered fill and subgrade surfaces to a depth of 12 inches.

B. During wet weather or unstable soil conditions, the Contractor shall have the Landscape Architect observe all areas to receive engineered fill and subgrade surfaces prior to implementation of remedial measures.

1. Upon approval of the Landscape Landscape Architect, all unstable areas to receive engineered fill and subgrade surfaces shall be disked or ripped to a minimum depth of 24 inches to allow exposed soil to dry. Depth and frequency of disking and ripping shall be determined by the Landscape Architect upon observation of the unstable soil conditions.
2. Upon approval of the Landscape Architect, all unstable areas to receive engineered fill and subgrade surfaces shall be over excavated 12 to 24 inches below existing grade and be replaced with aggregate base or coarse gravel underlain by geotextile fabric. Final depth of removal shall be determined by the Landscape Architect upon observation of the unstable soil conditions. The geotextile fabric shall be Amoco 2016 (woven) or approved equivalent, placed in accordance with manufacturer's recommendations.

C. The Contractor shall have the Landscape Architect observe and probe bottom of finish subgrade for its stability within existing trench fill extending to a width of 15 feet on each side of existing sanitary sewer pipelines beneath new pavement improvements.
   1. If loose or soft material is encountered, the existing trench fill shall be removed to a depth of two feet below finished subgrade elevation. The Contractor shall have the Landscape Architect observe and probe the bottom of the excavation for its stability prior to placing compacted engineered fill. If loose or soft material is encountered, geotextile/stabilizing fabric, Amoco 2016 (woven) or approved equivalent, shall be placed at the bottom of the excavation.
D. Recompact between 88 and 92 percent of maximum dry density at a uniform moisture content between 2 and 5 percent above optimum moisture content at the time of compaction.
E. Recompact to 95 percent of maximum dry density at a uniform moisture content between 2 and 5 percent above optimum moisture content at the time of compaction in the upper 6 inches of subgrade in all areas to support asphalt or rigid concrete pavements.
F. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.
B. Fill up to subgrade elevations unless otherwise indicated.
C. Employ a placement method that does not disturb or damage other work.
D. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
E. Uniformly moisture-conditioned to between 2 and 5 percent above optimum moisture content of fill materials to attain required compaction density.
F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches loose thickness.
G. Correct areas that are over-excavated.
H. Compaction Density Unless Otherwise Specified or Indicated:
   1. Between 88 and 92 percent of maximum dry density at a uniform moisture content between 2 and 5 percent above optimum moisture content at the time of

compaction.

2. At 95 percent of maximum dry density in the upper 6 inches of subgrade in all areas to support asphalt or rigid concrete pavements.

I. Reshape and re-compact fills subjected to construction vehicular traffic.

3.04 FILL AT SPECIFIC LOCATIONS

A. Use engineered fill unless otherwise specified or indicated.
B. Engineered fill at areas to receive rigid concrete pavements:
   1. Fill up to subgrade elevations.
   2. Maximum depth per lift: 8 inches, loose thickness.
   3. Between 88 and 92 percent of maximum dry density at a uniform moisture content at between 2 and 5 percent above optimum moisture content at the time of compaction.
   4. Compact upper 6 inches of subgrade to minimum 95 percent of maximum dry density at between 2 and 5 percent above optimum moisture content at the time of compaction.
C. At Lawn Areas: See Section 02260 Landscape Grading
D. At Planting Areas Other Than Lawns: See Section 02260 Landscape Grading
E. Trench Backfilling:
   1. See Storm Drain Pipe, Potable Water Supply Specifications
   2. See Section 02811 Irrigation

3.05 TOLERANCES

A. Top Surface of General Filling: See Section 02260 Landscape Grading
B. Top Surface of Filling Under Paved Areas: Plus or minus 0.05 foot from required elevations.

3.06 FIELD QUALITY CONTROL

A. Compaction density testing will be performed on compacted fill in accordance with ASTM D2922.
B. Results will be evaluated in relation to compaction curve determined by testing un-compacted material in accordance with ASTM D 1557 ("modified Proctor").

END OF SECTION

SECTION 02324

TRENCHING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, equipment and services necessary to provide all work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section includes, but is not limited to the following:

1. Section includes trenching, backfilling and compacting for water and storm drain utilities.

B. Related Work Specified in Other Sections

1. SECTION 02300 – EARTHWORK
2. SECTION 02510 – WATER DISTRIBUTION
3. SECTION 02630 – STORM DRAINAGE

C. Related Documents

1. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3); 2000.
2. County of Yuba Standard Construction Specifications.
3. Geotechnical Investigation for site is available in accordance with Information Available to Bidders.
4. Office of Safety and Health Act (OSHA) Construction Safety Orders.
5. California Code of Regulations Title 8: Construction Safety Orders.

D. Definitions

1. Bedding: Material from bottom of trench to bottom of pipe.
2. Initial Backfill: Material from bottom of pipe to 12-inches above top of pipe.
3. Relative Compaction: Ratio, expressed as a percentage of field dry density as compacted to a maximum dry density of representative sample of the same material determined by American Society for Testing and Materials (ASTM) Test Method D1557 (c).

4. Springline of Pipe: Imaginary line on surface of pipe at a vertical distance of ½ the outside diameter measured from the top or bottom of the pipe.

5. Subsequent Backfill: Material from 12-inches above top of pipe to subgrade of surface material or subgrade of surface facility or to finish grade.

6. Trench Excavation: Removal of material encountered above subgrade elevations and within horizontal trench dimensions.

    a. Authorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions as shown on plans or authorized by the Owner's Representative.

    b. Unauthorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions without authorization by the Owner's Representative. Unauthorized excavation shall be without additional compensation.

1.02 SUBMITTALS

A. Follow submittal procedures outlined in Section 01330 – SUBMITTAL PROCEDURES.

B. Product Data: Provide data for Products specified.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Project Record Documents: Record actual locations of pipe mains, valves, connections, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

F. Submit name of imported materials source.

G. Deliver samples of backfill and fill materials to Owner's Representative in quantities sufficient for testing. Deliver at least 15 days prior to use.

1.03 QUALITY ASSURANCE

A. Conform all work and materials to the recommendations or requirements of these Technical Specifications and plans and meet the approval of the Owner's Representative.

B. Conform all work to the appropriate portion(s) of County of Yuba Standard Construction Specifications.

C. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

D. The Owner's Representative will perform observations and tests required to enable him to form an opinion of the acceptability of the trench backfill. Correct the trench backfill that, in the opinion of the Owner's Representative, does not meet the requirements of these Technical Specifications.

E. Provide materials of each type from same source throughout the Work.

1.04 PROJECT CONDITIONS

A. The Contractor shall assess and evaluate all site conditions and layout the work before any earthwork shall begin.

B. Protect open, trenches, and utility structure excavations with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

C. Stockpile on-site and imported backfill material temporarily in an orderly and safe manner.

D. Provide dust and noise control in conformance with Division 1 General Requirements.

1.05 WARRANTY

A. The Contractor shall warrant against settlement for a period of one year after the date of final acceptance, and shall repair damage caused by settlement within that time. For the purpose of this Specification, settlement will be deemed to have occurred if on paved surfaces, the depression falls 3/8-inches below the average of the sides of the uncut portion.

PART 2 PRODUCTS

2.01 PIPE BEDDING AND INITIAL BACKFILL

A. Conform to County of Yuba Standards

2.02 WARNING TAPE

A. See Section 33 1300 – Water Distribution.

2.03 SUBSEQUENT BACKFILL

A. Conform to on-site or imported structural backfill in Section 02300 – Earthwork.

2.04 CONTROLLED DENSITY FILL (CDF) (in trenches)

A. Provide non-structural CDF, from bottom of trench to finish subgrade of subbase or base material, that can be excavated by hand and produce unconfined compressive 28-day strengths from 50-psi to a maximum of 150-psi. Provide aggregate no larger than 3/8-inch top size. The 3/8-inch aggregate shall not comprise more than 30% of the total aggregate content.

B. Cement: Conform to the standards as set forth in ASTM C-150, Type II Cement.

C. Fly Ash: Conform to the standards as set forth in ASTM C-618, for Class F pozzolan. Do not inhibit the entrainment of air with the fly ash.

D. Air Entraining Agent: Conform to the standards as set forth in ASTM C-260.

E. Aggregates need not meet the standards as set forth in ASTM C-33. Any aggregate, producing performances characteristics described herein will be accepted for consideration. The amount of material passing a #200 sieve shall not exceed 12% and no plastic fines shall be present.

F. Provide CDF that is a mixture of cement, Class F pozzolan, aggregate, air entraining agent and water. CDF shall be batched by a ready mixed concrete plant and delivered to the job site by means of transit mixing trucks.

G. The Contractor shall determine the actual mix proportions of the controlled density fill to meet job site conditions, minimum and maximum strengths, and unit weight. Entrained air content shall be a minimum of 4.0%. The actual entrained air content shall be established for each job with the materials and aggregates to be used to meet the placing and unit weight requirements. Entrained air content may be as high as 20% for fluidity requirements.

H. Mix design shall meet the Owner's Representative's approval.

2.05 CONCRETE STRUCTURE BEDDING AND BACKFILL

A. Precast Structures: Same materials to the same heights as specified for pipe bedding and backfill, or other material approved by the Owner's Representative.

B. Poured-in-Place Structures:

1. Bedding: Bedding shall meet the approval of the Owner's Representative. In general, bedding is not required, pour bases against undisturbed native earth in cut areas and against engineered fill compacted to 90% relative compaction in embankment areas.
2. Side Backfill: On-site or imported structural fill meeting the requirements given in Section 02300.

2.06 FILTER FABRIC

A. Filter Fabric:

1. Mirafi 140N (Mirafi Inc., Charlotte, NC) (Tel. 800-438-1855) or equal.

PART 3 EXECUTION

3.01 PREPARATION AND EXAMINATION

A. Underpin adjacent structures, which may be damaged by excavation Work, including utilities.

B. Maintain trench crossings for vehicular and pedestrian traffic at street crossing, driveways and fire hydrants.

C. Identify required lines, levels, contours, and datum locations.

D. Locate, identify, and protect utilities that remain and protect from damage.

E. See Section 02300 Earthwork for additional requirements.

3.02 TRENCHING AND EXCAVATION

A. Existing PCC or AC Areas: Cut PCC or AC to full depth at a minimum distance of 12-inches beyond the edge of the trench.

B. Excavate by hand or machine. For gravity systems begin excavation at the outlet end and proceed upstream. Excavate sides of the trench parallel and equal distant from the centerline of the pipe. Hand trim excavation. Remove loose matter.

C. Excavation Depth for Bedding: Minimum of 4-inches below bottom of pipe or as otherwise allowed or required by the Owner's Representative, except that bedding is not required for nominal pipe diameters of 2-inches or less.

D. Excavation Width at Springline of Pipe:

1. Up to a nominal pipe diameter of 24-inches: Minimum of twice the outside pipe diameter, or as otherwise allowed or required by the Owner's Representative.

2. Nominal pipe diameter of 30-inches through 36-inches: Minimum of the outside pipe diameter plus 2-feet, or as otherwise allowed or required by the Owner's Representative.
3. Nominal pipe diameter of 42-inches through 60-inches: Minimum of the outside pipe diameter plus 3-feet, or as otherwise allowed or required by the Owner's Representative.

E. Over-Excavations: Backfill trenches that have been excavated below bedding design

subgrade, with approved bedding material.

F. Comply with the Owner's limitations on the amount of trench that is opened or partially opened at any one time. Do not leave trenches open overnight without the approval of the Owner.

G. Where forming is required, excavate only as much material as necessary to permit placing and removal of forms.

H. Bottoms of trenches will be subject to testing by Owner's Representative. Correct deficiencies as directed by the Owner's Representative.

I. Grade bottom of trench to provide uniform thickness of bedding material and to provide uniform bearing and support for pipe along entire length. Remove stones to avoid point bearing.

3.03 CONTROL OF WATER AND DEWATERING

A. Be solely responsible for dewatering trenches and excavations and subsequent control of ground and surface water. Provide and maintain such pumps or other equipment as may be necessary to control ground water and seepage to the satisfaction of the Owner's Representative and the Owner until backfilling is completed.

B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.

C. Obtain the Owner's Representative's approval for proposed control of water and dewatering methods.

D. Reroute surface water runoff away from open trenches and excavations. Do not allow water to accumulate in trenches and excavations.

E. Maintain dewatering system in place until dewatering is no longer required.

3.04 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the pipes and appurtenances being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Owner's Representative, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted,

together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations in trench section or around structures shall precede a response to the submittal by the Owner.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the line, grade, or backfill compaction or operation of the utility being installed or adjacent utilities and facilities.

3.05 PIPE BEDDING

A. Obtain approval of bedding material from the Owner's Representative.

B. Pipe Bedding shall be per the City of Wheatland Standards and per the Geotechnical Investigation report.

C. Upon completion of bedding operations, and prior to the installation of pipe, notify the Owner's Representative, who will inspect the bedding layer. Do not commence pipe laying until the Owner's Representative has approved the bedding.

3.06 WARNING TAPE

A. Install in accordance with Section 033 1100 – Water Distribution.

3.07 BACKFILLING

A. Obtain approval of backfill material from Owner's Representative.

B. Bring initial backfill up simultaneously on both sides of the pipe, so as to prevent any displacement of the pipe from its true alignment. Initial Backfill shall be per the City of Wheatland Standards and per the Geotechnical Investigation report. Jetting or ponding of initial backfill material will not be permitted.

C. Bring subsequent backfill to subgrade or finish grade as indicated. Subsequent Backfill shall be per the City of Wheatland Standards and per the Geotechnical Investigation report. Jetting or ponding of subsequent backfill material will not be permitted.

D. Do not use compaction equipment or methods that produce horizontal or vertical earth pressures that may cause excessive pipe displacement or damage the pipe.

E. Utility backfill shall be inspected and tested by the Owner's Representative during placement. Cooperate with the Owner's Representative and provide working space for such tests in operations. Backfill not compacted in accordance with these specifications shall be re-compacted or removed as necessary and replaced to meet the specified requirements, to the satisfaction of the Owner's Representative and the Owner prior to proceeding with the Project.

3.08 CLEANUP

A. Leave unused materials in a neat, compact stockpile during progress of work.

B. Remove unused stockpiled materials. Leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

C. Upon completion of utility earthwork all lines, manholes catch basins, inlets, water meter boxes and other structures shall be thoroughly cleaned of dirt, rubbish, debris and obstructions of any kind to the satisfaction of the Owner.

D. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

E. The Contractor shall remove and dispose of all excess excavated material to a suitable site. The proper and legal disposal shall be the responsibility of the Contractor.

END OF SECTION

SECTION 02470

SITE FURNISHINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

The work included in this section generally consists of providing all labor, equipment and materials necessary to install all site furnishings complete as shown on the plans and as described herein.

1.02 RELATED SECTIONS

A. Section 02515 - Concrete Paving

1.03 SUBMITTALS

Submit 6 copies of manufacturer's cut sheet and specification for approval within two weeks of notice to proceed.

1.04 DELIVERY, STORAGE AND HANDLING

Contractor assumes all responsibility for storage of all materials relative to this project. Owner assumes no liability for losses or damages from any cause as a result of such storage.

1.05 PROJECT CONDITIONS – PROTECTION

A. After site furnishings are installed, all damage to surrounding paving, turf, and irrigation system shall be repaired by the contractor at the contractor's expense.

B. All trees and shrubs in and around the project site shall be protected by the contractor and, if damaged, replaced at the contractor's expense. This provision is in effect until acceptance by owner of the complete project

1.06 LOCATION INSPECTION

No equipment, apparatus or foundations for same shall be placed until location stakes have been inspected and accepted by the Owner.

1.07 GUARANTEE & LIABILITY INSURANCES

A. Manufacturer shall guarantee all materials and workmanship for a period of one (1) year exclusive of vandalism.

B. The manufacturer will be required to provide complete installation drawings including specifications and a replacement parts list for all products.

C. Contractor shall provide a written guarantee on his firm's letterhead for all materials and workmanship for a period of one (1) year, exclusive of vandalism. Written guarantee shall be submitted to the Owner at the final inspection prior to final acceptance of the work.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; free of surface blemishes and complying with the following:

1. Rolled or Cold-Finished Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).
2. Extruded Bars, Rods, Wire, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
3. Structural Pipe and Tube: ASTM B 429.
4. Sheet and Plate: ASTM B 209 (ASTM B 209M).
5. Castings: ASTM B 26/B 26M.

B. Steel and Iron: Free of surface blemishes and complying with the following:

1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53, or electric-resistance-welded pipe complying with ASTM A 135.
3. Tubing: Cold-formed steel tubing complying with ASTM A 500.
4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 1011/A 1011M and complying with dimensional tolerances in ASTM A 500; zinc coated internally and externally.
5. Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.
6. Expanded Metal: Carbon-steel sheets, deburred after expansion, and complying with ASTM F 1267.
7. Malleable-Iron Castings: ASTM A 47/A 47M, grade as recommended by fabricator for type of use intended.
8. Gray-Iron Castings: ASTM A 48/A 48M, Class 200.

C. Stainless Steel: Free of surface blemishes and complying with the following:

1. Sheet, Strip, Plate, and Flat Bars: ASTM A 666.
2. Pipe: Schedule 40 steel pipe complying with ASTM A 312/A 312M.
3. Tubing: ASTM A 554.

D. Fiberglass: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and manufacturer's standard finish.

E. Plastic: Color impregnated, color and UV-light stabilized, and mold resistant.

1. Polyethylene: Fabricated from virgin plastic HDPE resin.

F. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials; commercial quality, tamperproof, vandal and theft resistant, concealed, recessed, and capped or plugged.

G. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.

H. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.

I. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:

1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, polymer film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil (0.0076 mm) thick.
2. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.02 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Preservative-Treated Wood Components: Complete fabrication of treated items before treatment if possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces.

E. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

F. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.03 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.04 ALUMINUM FINISHES

Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.05 STEEL AND GALVANIZED STEEL FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

B. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

2.06 IRON FINISHES

Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.07 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

PART 3 – EXECUTION

3.01 LAYOUT

Contractor shall stake/mark locations for all slabs and foundations and shall obtain the approval of their location from Landscape Architect prior to commencing any digging. Locations shall be adjusted to provide minimum clear distances required from all edges of slabs, trees, irrigation heads, or other obstructions.

3.02 CONCRETE WORK

All concrete work shall conform to the Standard Plans, and those of Section 02515. Contractor shall obtain the approval of all forming from the Landscape Architect prior to pouring any concrete slabs. Foundations holes shall be inspected and approved by the Public Works Inspector prior to pouring concrete.

3.03 INSTALLATION

A. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

B. Install site furnishings level, plumb, true, and securely anchored and positioned at locations indicated on Drawings.

C. .Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch (19 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

D. All site furnishings shall be installed with vandal-proof hardware or made vandal-proof (deforming or peening).

E. Maintain specific required distance between top of paving and product, drinking fountain, bench, etc).

F. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

G. All products to be installed according the manufacturers' specifications. If discrepancies occur, notify Owner's Representative as soon as possible before proceeding with installation.

H. Contractor to repair, repaint all minor damage during installation.

3.04 PROTECTION OF EXISTING IMPROVEMENTS

Contractor shall protect all existing improvements from damage. All disturbed turf areas shall be fine graded filling all depressions, wheel ruts and irregularities and shall be reseeded with seed mix specified by the Landscape Architect. Contractor shall make all repairs and restore all damaged turf areas at his sole expense.

3.05 CLEAN-UP

A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

B. Contractor shall clean up and legally dispose of all unused materials, excess soil, and debris at regular intervals throughout the duration of the work, and as directed by the Owner.

END OF SECTION

SECTION 02510

WATER DISTRIBUTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, equipment and services necessary to provide all work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section includes, but is not limited to the following:

1. Pipe and fittings for site domestic water.

2. Valves and appurtenances.

B. Related Work Specified in Other Sections

1. SECTION 02324 – TRENCHING

C. Related Documents

1. American Water Works Association (AWWA) C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water; American Water Works Association; 2003 (ANSI/AWWA C104/A21.4).

2. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2000 (ANSI/AWWA C111/A21.11).

3. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; 2002 (ANSI/AWWA C151/A21.51).

4. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 In. Through 24 In. NPS; American Water Works Association; 2001 (ANSI/AWWA C508).

5. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; 2001 (ANSI/AWWA C509).

6. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution; American Water Works Association; 1997 (ANSI/AWWA C900/C900a).

1.02 SUBMITTALS

A. See Section 01330 - SUBMITTAL PROCEDURES.

B. Product Data: Provide data acknowledging that products meet requirements of standards referenced.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Restraint Calculation: Provide calculations for mechanical restraint distances for all pipe joints. Provide data acknowledging that calculations provided conform to manufacturer's recommendations for size of pipe, type of pipe, and site soil type.

E. Project Record Documents:

1. Record location of pipe runs, connections, valves, restraints and invert elevations.

2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.03 QUALITY ASSURANCE

A. Comply with requirements of utility supplying water. Do not operate existing valves or tap existing piping without written permission and/or presence of utility company representative.

B. Comply with the following requirements and standards:

3. NSF 61: "Drinking Water System Components-Health Effects" for materials for potable water.

4. NFPA 24: "Installation of Private Fire Service Mains and Their Appurtenances" for materials, installations, tests, flushing, and valve and hydrant supervision.

5. NFPA 70: "National Electric Code" for electrical connections between wiring and electrically operated devices.

C. Provide listing/approval stamp, label, or other marking on piping and specialties made to a specified standard.

1.04 MATERIAL DELIVERY, STORAGE AND HANDLING

A. Preparation for Transport: Prepare valves, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.

2. Protect valves against damage to threaded ends and flange faces.

3. Set Valves in best position for handling. Set valves closed to prevent rattling.

B. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage and handling to prevent pipe end damage and to prevent entrance of dirt, debris and moisture.

C. Handling: Use slings to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

D. During Storage: Use precautions for valves according to the following.

4. Do not remove end protectors, unless necessary for inspection, then reinstall for storage.

5. Protection from Weather: Store indoors and maintain temperature higher than ambient dew-point temperature. . Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

E. Do not store plastic pipe and fittings in direct sunlight.

F. Protect pipe, fittings, flanges, seals and specialties from moisture, dirt and damage.

G. Protect linings and coatings from damage.

H. Handle precast boxes, vaults and other precast structures according to manufacturer's written instructions.

I. Protect imported bedding and backfill material from contamination by other materials.

1.05 COORDINATION

A. Coordinate connection to existing water mains with Owner

B. Coordinate piping materials, sizes, entry locations, and pressure requirements with building domestic water distribution piping and fire protection piping.

PART 2 PRODUCTS

2.01 PIPE MATERIALS

A. Ductile Iron: Ductile Cast Iron cement lined pressure class 350.

B. Plastic - 4 inches and over: PVC pipe shall be minimum Class 200 AWWA C900 (minimum Class 165 AWWA C905 for pipes 16 inches and larger). Underwriters' Laboratories, Inc. (UL) listed, Factory Mutual and National Sanitation Foundation (NSF) approved. Pipe shall be furnished in minimum standard lengths of 20 feet

1. Fittings: AWWA C111, cast iron mechanical joint type, 250 pound working pressure, ductile iron, mechanical joints with SBR rubber ring gaskets. Flanged outlets shall conform to ANDI B16.1, 125 pounds.

2. Bolts and nuts for flanges shall be Type 304 stainless steel, American Society for Testing and Materials (ASTM) A193, Grade B8M hex head bolts and American Society for Testing and Materials A194, Grade 8M, hex head nuts. Washers shall be of the same material as the bolts.

2.02 VALVES

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Valves 2 inches through 12 inches:

1. Gate valve: per City of Wheatland Standards

2.03 BEDDING AND COVER MATERIALS

A. Bedding and Cover: As specified in Section 312333 Trenching and Backfilling.

2.04 COUPLINGS AND SLEEVES

A. General: All couplings and sleeves shall be a minimum of 250 psi working pressure-rated unless otherwise noted.

B. For DIP and PVC pipe:

1. Unless otherwise noted, couplings and sleeves for DIP and PVC shall be ductile iron conforming to AWWA C153, size 3 through 24 inch and AWWA C110 greater than 24 inch, and shall be 350 psi working pressure rated. AWWA C100 fittings shall be ductile iron only. Couplings, sleeves, and accessories shall be manufactured by U.S. Pipe TrimTyte, Union Foundry, Tyler; or equal.

2. Unless otherwise noted, flanges on all DIP spools shall conform to AWWA C115.

3. Push-on joints shall have SBR rubber ring gaskets.

4. All fittings shall be restrained joints. Pipes shall be restrained using a wedge-action, self-actuating lug type restraint devise as manufactured by EBAA Iron Sales, StarGrip, or equal. Concrete thrust blocks are not permitted except at connections to existing unrestrained pipe or fittings or at fire hydrants.

5. All pipe joints within the minimum distances listed in the following table shall be restrained. Restraint shall be by use of locking gasket for ductile iron pipe. Restraint for PVC pipe shall by use of a restraint harness EBAA Series 2800, StarGrip, or equal.

Pipe Diameter, inches	Minimum Restraint Length, feet						
	Horizontal Elbows				Tee, Run & Branch	One-Size Reducer	Dead End
	11.25	22.5	45	90			
3	1	2	3	8	8		24
4	1	2	4	10	10	9	29
6	1	3	6	14	14	21	42
8	2	4	7	18	18	23	55
10	2	4	9	21	21	22	66
12	2	3	7	17	17	26	53
14	2	4	8	20	20	16	61
16	2	4	9	22	22	16	69
18	2	5	10	25	25	16	77
20	3	5	11	27	27	16	84
24	3	6	13	32	32	30	100
30	4	8	16	38	38	42	121
36	4	9	18	45	45	43	143

2.05 ACCESSORIES

A. Mechanical Restraints:

1. PVC Pipes: Certain Teed Certa Lock, Romac Grip Rings, or equal.

2. Ductile Iron Pipes: Field Lock Gaskets, Mega Lug 1100 series, TR Flex, or equal.

B. Valve Boxes: Precast concrete with cast iron traffic covers with the word WATER embossed on the top surface of the lid. Christy G5 or equal. Cover shall be painted light blue (ICI Devoe DC41000 semi gloss or equal). For all valves an identification number shall be welded onto valve box rim. Identification number shall be assigned in advance by Owner.

C. Miscellaneous nuts and bolts shall be stainless steel.

D. Rods and Clamps: Socket clamps shall be stainless steel, four bolt type, equipped with stainless steel socket clamp washers and nuts Grinnell Fig. 595 and 594, Elcen Fig. 37 and 37X, or equal.

1. Rods shall be stainless steel, 3/4 inch diameter.

E. All underground water piping shall be accompanied by a Solid Core #10 copper tracer wire. Both ends of tracer wire shall be accessible at all utility valve boxes.

F. Line Marker: Underground-type conductive line marker, permanent, brightly colored, continuous-printed plastic tape, intended for direct burial service; not less than 6 inches wide by 4 mils thick. Provide blue tape with "CAUTION WATER LINE BURIED BELOW" in black letters; Allen Systems Inc., Emed Co. Inc., or equal.

G. Tapping Sleeve: Cast iron or stainless mechanical joint type sleeve, sized specifically for actual O.D. and piping material, Mueller, Clow, or equal.

PART 3 EXECUTION

3.01 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.02 TRENCHING

A. See Section 02324 - TRENCHING for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Buried pipe shall have at least 36 inches of cover and 12 inches of clearance from other utilities.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, and then complete backfilling.

3.03 INSTALLATION - PIPE

A. Have on hand all installation manuals, brochures, and procedures for the equipment and materials concerned.

B. Follow manufacturer instructions, where such are provided, in all cases that cover points not shown on the Drawings or specified herein. Manufacturer's instructions do not take precedence over the Drawings and Specifications. Where manufacturer's instructions are in conflict with the Drawings and Specification, submit the conflicting instructions to the Owner's Representative for clarification before performing the work.

C. Use fittings to make all changes in direction and size unless otherwise indicated on the Drawings.

D. Maintain factory plastic end covers on the pipe during storage. Caps shall be removed upon installation of pipe to insure cleanliness.

E. Lay piping on a bed of the specified sand, at least 6-inches thick, on firm undisturbed earth. Remove loose rock, clods, and debris from the trench before placing bedding sand and before laying any pipe.

F. The piping shall be made up with the pipe barrel bearing evenly along its full length on the sand bed on the bottom of the trench.

G. In the case of steel or other rigid joint piping, excavate holes under joints and connections for access for making up, welding, testing and wrapping joints.

H. Thoroughly clean out each section of pipe and fitting before lowering into the trench. Clean each pipe or fitting by swabbing-out, brushing-out, blowing-out with compressed air, washing-out with water, or by any combination of these methods necessary to remove all foreign matter.

I. If cleaned pipe sections and fittings cannot be placed in the trench without getting dirt into the open ends, tie tightly woven canvas or other type of approved cover over the ends of the pipes and fittings until they have been lowered into position in the trench. After removal of the covers in the trench, completely remove foreign matter from the pipe ends and fittings.

J. Do not lower any pipe or fitting into a trench that contains water. Pump water from wet trenches, and keep the trenches dry until the joints have been completed and the open ends of the pipes have been closed with watertight plugs or bulkheads. Do not remove the plug or bulkhead unless the trench is dry.

K. Assemble lengths of PVC that are joined by couplings, Tyton type push-on joints, Ring-Tite, Fluid-Tite, or equal, such that centerline of two pipes being joined do not form an angle exceeding 2 inches in any plane. In addition, the angle formed in the vertical plane shall not exceed 1-1/2 inch.

L. Install trace wire on top of pipe.

M. Install continuous line marker 18 inches above top of pipe; coordinate with Section 02324 - TRENCHING.

3.04 INSTALLATION - VALVES

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

3.05 CONNECTIONS TO EXISTING WATER SYSTEM

A. Under no circumstances shall existing lines or utilities be interrupted without prior approval of the Owner. Submit a request for this approval to the Owner's Representative, and also state the maximum duration of shutdown. The Contractor may have to adjust work or perform during off-hours.

B. Schedule all outages for utility tie-in work well in advance, and by written notice to the Owner at least 7 working days in advance of the desired shutdown.

C. In preparation for tie-ins to the utility systems, the Contractor shall coordinate with the Owner's Representative before draining and/or blowing the existing piping prior to start of tie-in work by the Contractor. In all cases, the Owner will close the appropriate valves to isolate the area of work.

3.06 FLUSHING

A. The entire piping system shall be thoroughly flushed out until acceptance of the Owner's Representative. All tests shall be conducted at such times as directed by and in the presence of the Owner's Representative.

3.07 PIPE TESTING

B. Water piping shall be hydrostatically tested at 150 psi pressure for four hours and proven watertight. Provide all instruments, facilities, and labor to conduct testing and placing in operation.

C. Piping shall be tested in sections. Testing under this Section of the work shall be done before final connections to existing utility piping is made, with the provision that subsequent leaks, if developed, at these conditions shall be corrected.

D. Any part of the system, including all accessories, that shows failure during testing shall immediately be repaired or replaced with new materials. The system shall be completely retested after repair for replacement. This procedure shall be repeated, if necessary, until all parts of the system withstand the specified tests. All retesting costs shall be part of the Contract.

E. Leakage rate shall not exceed 1.5 gallons/hour/1000 feet of pipe over a 2-hour test period.

F. Tests shall be witnessed by the Owner's Representative. At least 48 hours advance notice before testing shall be given to Owner's Representative.

3.08 DISINFECTION

A. All domestic water piping shall be disinfected upon installation according to the City of Chico Standards.

3.09 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with City of Chico Standards.

3.10 DISPOSAL

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the Owner's property.

END OF SECTION

SECTION 02515

SITE CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED

Furnish all labor, materials and equipment required for the reinforcement, formwork and the construction of cast-in-place concrete sidewalks, driveways, porches and mow curbs including all other work required to produce a finished project in accordance with the Drawings and as specified herein.

1.02 RELATED WORK

A. Section 02321 Fill and Backfill
B. Section 02721 Aggregate Base Course
C. Section 02764 Pavement Joint Sealants

1.03 QUALITY ASSURANCE

A. Comply with ASTM A-615 "Standard Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement," and "Manual of Standard Practice for Detailing Reinforced Concrete Structures," publication ACI 315-65 of the American Concrete Institute.

B. Comply with all pertinent recommendations contained in American Concrete Institute (ACI), "Recommended Practice of Concrete Formwork, ACI-347."

C. Construct forms to sizes, shapes, lines and dimensions indicated on Drawings, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finish. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

D. Provide complete forms of such strength and construction as to prevent any spread, shifting, or settling when concrete is deposited, and tight enough to avoid any leakage or washing out of cement mortar.

1.04 JOB CONDITIONS

A. Temperature: All concrete design mixes and methods of protecting concrete shall be resubmitted to the Landscape Architect for review when the following temperatures are anticipated:

1. The temperature is below 40° F, or when conditions indicate that the temperature will fall below 40° F within seventy-two (72) hours.

2. The placing temperature of the concrete is, or anticipated to be, above 80° F.

1.05 COORDINATION

A. Secure all pipe sleeves, anchors and bolts, including those for angle frames, inserts, ties and other materials in connection with concrete construction, in position before concrete is placed.

B. Obtain information and instructions from other Trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them to be embedded in concrete so provisions for their work can be made without delaying the project.

C. Make cutting and/or patching made necessary by failure or delay in complying with these requirements at no cost to the Owner.

1.06 FORM CONSTRUCTION TOLERANCES

A. Set form to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work so that forms can remain in place at least twenty-four (24) hours after concrete placement.

B. Check completed formwork for grade and alignment to following tolerances:

1. Top of forms not more than one-eighth (1/8) inch in ten (10) feet vertical elevation.

2. Vertical face on longitudinal axis not more than one-fourth (1/4) inch in ten (10) feet horizontal width.

1.07 SMOOTHNESS TOLERANCE

A. Cement finish surfaces shall be of such smoothness and evenness that they shall contact the entire length of a 10-foot straight edge laid in any direction, with an allowable tolerance of 1/8 inch. Any operations necessary to achieve this result should be performed by the Contractor, at no additional cost to the Owner.

B. No patching will be permitted to correct defective work; defective sections shall be removed and replaced. No extensions of time will be allowed for correcting defective work.

1.08 INSPECTIONS

A. Inspections will be required. Contractor shall call for inspection a minimum of 48 hours (two working days) prior to need.

B. The contractor shall-call for inspection during specific phases of construction. They shall include the following, each prior to pour:
1. All Form Work
2. All Footings

3. Subgrade
4. Steel Reinforcing

C. Contractor shall notify the Landscape Architect 48 hours prior to each concrete pour.

D. Any work covered prior to inspection shall be opened to view by the Contractor at his expense.

1.09 TESTING

All testing shall be as required by the Standard Specifications and these Contract Documents.

1.10 MOCK-UPS

A. Contractor shall provide a 4'x4' sample pour of finish work for review and approval by Architect prior to installation of remainder of concrete finish work.

B. Ensure that each mock-up contains joint types specified on project, i.e. construction, contraction, and isolation.

C. Locate mock-ups in a conveniently accessible and protected place. At contractor's cost, additional mock-ups shall be provided as needed until approved. Approved mock-ups will be standard for future installation review.

1.11 SUBMITTALS

A. See Section 01300 – Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's data on manufactured products for approval.

C. Shop drawings: Indicate formwork, dimensions, reinforcement, accessories and control and expansion joint layout.

D. Mix design: Submit each class of concrete to approved inspection and testing firm and the Owner for review prior to commencement of concrete operations.

E. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

PART 2 - PRODUCTS

2.01 CONCRETE REINFORCEMENT

A. Reinforcing Bars: Deformed Billet Steel Bars, ASTM A-615, Grade 40 or Grade 60.

B. Welded Wire Mesh: ASTM A-186 plain type and uncoated finish.

C. Tie Wires: Black annealed, ASTM A-82, minimum 16 gauge.

D. Chains, Bolsters, Bar supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

E. Stirrup Steel: ASTM A-82.

F. Smooth dowel steel bars for construction joints: ASTM A-29, Grade 60.

1. Where indicated, provide dowel sleeve at one end of greased dowel to permit longitudinal movement of dowel within concrete section.

2. Provide for movement which equals joint width plus one-half (1/2) inch.

2.02 CONCRETE FORM MATERIALS

A. Slabs, Walks, Walls, Columns and Concrete edges: Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

1. Use flexible spring steel forms or laminated boards to form radius bends and foam templates for detailed edges as required.

2. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

B. Forms for Exposed Finish Concrete: Unless otherwise shown, construct formwork for exposed concrete surfaces with plywood, to provide continuous, straight, smooth, exposed surfaces. Provide plywood in largest practicable sizes to minimize number of joints. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection. Provide solid backing and form supports to insure stability of forms. On any length of wall the difference in form piece size shall not be greater than 25% plus or minus the dimension of the smallest piece and in no case smaller than two (2) inches in width.

1. Use five (5) ply exterior plywood complying with U.S. Product Standard PS 1-66, "B-B (Concrete Form) Plywood," Class 1, Exterior Grade or better, with each piece bearing legible inspection trademark.

2. Use form material in largest practicable sizes to minimize number of form joints. Arrange form joints orderly and symmetrically with minimum number of joints.

C. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least two (2) edges and on one side for tight fit that is fir or pine, No. 2 common or better.

D. Circular Concrete Footings or Columns: All round concrete footings or columns, size as indicated on Drawings, shall be formed with seamless "SONOTUBE" fiber forms as manufactured by Sonoco Products Company of Hartsville, South Carolina.

E. Forms for Curved Exposed Surfaces: Forms shall be built up with hand sawn two (2) inch stringers, sized and carefully fitted to desired form, with segmental tacking. Exposed face surfaces shall be sheet metal, oil tempered hardboard, or one-quarter (1/4) inch waterproof plywood facing.

F. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties (break back cone ties), designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal. All form ties to be used on unexposed concrete surfaces.

G. Chamfer Exposed Corners and Edges: Chamfer exposed corners and edges as indicated on Drawings using wood chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

H. Radius Exposed Corners: Apply concrete radius tooled edges to exposed concrete corners as dimensioned and sized on Drawings.

I. Rough Hardware: Pipe, conduit, bolts, anchors, etc., as indicated on Drawings or needed shall be furnished and set.

J. Chamfer Horizontal Reveal: Chamfer concrete wall horizontal reveals, as indicated on Drawings, using wood chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

2.03 CONCRETE ACCESSORIES

A. Bonding Agent: ASTM C 1059, Type II acrylic non-redispersable type.

B. Epoxy Bonding System: ASTM C 881, type as required by project conditions.

C. Vapor Retarder: 6 mil (0.5 mm) thick clear polyethylene film, type recommended for below grade application.

D. Chemical Hardener: Fluosilicate solution designed for densification of cured concrete slabs.

E. Non-Shrink Grout ASTM C 1107; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 48 Hours: 2,400 psi (17 MPa).

2. Minimum Compressive Strength at 28 Days: 7,000 psi (48 MPa).

F. Moisture-Retaining Cover: ASTM C 171; white burlap-polyethylene sheet.

G. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent with guarantee not to leave surface residue.

H. Waterproof Barrier: Thoroseal waterproof cement-based coating, color gray.

2.04 JOINT DEVICES AND MATERIALS

A. Expansion Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard of felt, 1/4 inch thick and full depth of concrete less 1/2 inch.

B. Construction Joint Devices: Integral extruded plastic; 1/4 inch thick, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

C. Joint Cap: Plastic joint size to match expansion joint size by Sealtight or approved equal

D. Elastomeric Sealant: Joint sealer color to match concrete.

E. See Section 02764 Pavement Joint Sealers for additional specifications.

2.05 CONCRETE

A. Concrete Mix:

1. Mix concrete in accordance with ASTM C-94 and with aggregates complying with ASTM C-33 and Portland Cement ASTM C-150, Type II.

2. All concrete mixes shall be designed by a testing laboratory approved by the Owner's Representative or Landscape Architect. All mixes shall conform to applicable building code requirements listed herein or on the Drawings. All mix designs shall be submitted to the Landscape Architect for approval before being used. Mix design shall show proportions of cement, fine and coarse aggregate, and water and graduation of combined aggregates. Calcium chloride shall not be added at any mix.

3. Alteration of approved concrete mixes is not acceptable. Installation of concrete other than approved mixes shall be replaced at the expense of the contractor.

4. Concrete shall be as specified:

Item	Minimum Cement Content	28-Day Minimum Strength	Max. Slump	Max. Aggregate Size	Gal/Bag Water to Cement Ratio Max.
Slabs on Grade, Curbs, Exterior Walkways	540 lb/cu. yd.	3,500 PSI	4 in.	3/4 in.	SIX
Walls	540 lb/cu. yd.	4,000 PSI	2-1/2 in.	3/4 in.	FIVE

2.06 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C 685. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Transit Mixers: Comply with ASTM C 94/C 94M.

2.07 ADMIXTURES

A. Chemical admixtures shall conform to the requirements, of Section 90-4.04 through 90-4.07 of the State Standard Specifications.

B. See Site Colored Concrete Section 03330

2.08 PORTLAND CEMENT CONCRETE

Shall conform to the provisions in Standard Specifications Section 90 "Portland Cement".

2.10 EXPANSION JOINTS

Shall be as shown on plans and details. Submit samples of preformed material and sealant for approval by the Owner.

2.11 CONCRETE CURING COMPOUND

Plast-A-Cure Heavy Duty Curing Compound or Approved Equal: Concrete curing compound shall be a white-pigmented curing compound conforming to the requirements of Section 90-7.01 B, "Curing Compound Method" of the State Standard Specifications and shall be a product conforming to ASTM C 309, Type 2, Class B.

2.12 SCORE JOINT

Score joints shall be as shown on the drawings and details, or as called for in the specifications.

PART 3 - EXECUTION

3.01 GENERAL

A. All work shall conform to the foundation investigation report. Slab thicknesses, reinforcement, compaction requirements, and base recommendations shall take precedence over details and plan callouts.

B. All concrete slabs shall slope to drain. Depressions in the slab surface that hold water ("bird baths") will not be acceptable.

C. Install concrete and cement finish work true to lines, dimensions and levels.

D. Protect all finished concrete from graffiti. Contractor shall be responsible for providing concrete watchmen. A graffiti finish will not be acceptable.

E. Remove and replace defective concrete or cement work with new materials. Permission to patch any defective area shall not be a waiver of the Owner's right to require complete removal of defective work if patching does not restore quality and appearance of work.

F. Verify lines, levels, and dimensions before proceeding with work of this section.

G. No advertising impression, stamp, or mark of any description will be permitted on surface of concrete or cement finish.

3.02 CONCRETE REINFORCEMENT PLACEMENT

A. Fabricate reinforcement in accordance with ACI-315, providing a minimum concrete cover of two (2) inches.

B. Place all reinforcement in the exact position shown on the Drawings and secure in position during the placing and compacting of concrete. Wire bars together with No.16 gauge wire with ties at all intersections except where spacing is less than twelve (12) inches in each direction, in which case tie alternate intersections.

C. Overlap welded wire mesh one square plus six (6) inches to maintain a uniform strength, and securely fasten at the ends, edges and support to maintain clearances.

D. Place all sleeves, inserts, anchors and embedded items required for adjoining work or for its support prior to concreting. Fill voids in embedded items temporarily with readily removable material to prevent entry of concrete.

E. Give all contractors and subcontractors whose work is related to concrete or supported by it, ample notice and opportunity to introduce and/or furnish embedded items before concrete placement.

3.03 CONCRETE FORMWORK CONSTRUCTION

A. Construct support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete.

B. Contractor assumes full responsibility in the removal of forms. The length of time forms must remain in place depends on the rate of time required for concrete to obtain a proper strength. Remove forms after the concrete is sufficiently hard to prevent damage to concrete.

C. Reuse of Forms:

1. Do not reuse forms if there is any evidence of surface wear or defect which would impair quality of surface.

2. Thoroughly clean and properly coat forms before reuse.

D. Earth Forms

Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement *of* concrete.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in or passing through concrete work.

B. Locate and secure in place items that will be cast directly into concrete.

C. Coordinate with work of other sections in forming and placing openings, slots, inlets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement

3.06 FORM REMOVAL

Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

A. Field Quality Control:

1. Observe formwork continuously while concrete is being placed to see that there are no deviations from desired elevation, alignment, plumbness or camber.

2. If during construction any weakness develops and falsework shows undue settlement or discoloration, stop work, remove affected construction if permanently damaged, and strengthen falsework.

3. Verify that forms are clean and free of rust before applying release agent.

3.07 CONCRETE PLACEMENT AND FINISHES

A. Placing Concrete:

1. Place concrete in accordance with ACI-304 and Section 2605 of the Uniform Building Code. Immediately after depositing, compact concrete thoroughly by mechanical vibration. No vibrating of form is allowed. Mixing shall be continuous, with no interruptions from the time the truck is filled until the time it is emptied. Concrete shall be placed within one hour of the time water is first added.

2. Insure anchors, seats, plates, and other items to be cast into concrete are placed, held securely and will not cause hardship in placing concrete.

3. Insure reinforcement, inserts, embedded parts, etc. are not disturbed during concrete placement.

4. Pour concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur, unless otherwise indicated on the Drawings.

5. Lines and Grades: Elevations requiring accurate placement shall be set by a competent instrument man, using a professional type instrument.

3. For all concrete placed on soil, the subgrade shall be wet and compacted prior to placing.

4. Before placing concrete mixing, conveying and finishing equipment, forms and reinforcing shall be well-cleaned. Wet form before placing concrete, unless oiled forms are used.

5. Notify Landscape Architect at least 48, hours prior to commencement of concrete placement operations.

6. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches (150 mm) and seal watertight.

7. Install joint devices in accordance with manufacturer's instructions.

8. Install construction joint devices in coordination with concrete slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

9. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

10. Place concrete continuously between predetermined expansion, control, and construction joints.

    a. Do not interrupt successive placement; do not permit cold joints to occur

B. Concrete Finishing

1. Exterior Slabs and Sidewalks:

    a. Finish per plan.

    b. All exterior slabs, sidewalks and top of walls to have non-slip uniform surface per plan.

    c. After concrete has been placed, consolidate strike off and screed uniformly to the required grades. Float concrete to a uniform surface, then steel trowel lightly to compact surface. Finish exterior slabs and sidewalks as detailed on Drawings. Exterior slabs and sidewalks shall be formed with slopes as indicated, as directed or as necessary to insure proper drainage. Exterior slabs and sidewalks adjacent to buildings shall drain away from buildings.

2. Exterior Walls:

    a. Finish per plan

    b. Consolidate by vibration so that concrete is thoroughly worked around reinforcement, embedded items and into corners of forms to eliminate air or stone pockets. As-cast concrete surfaces obtained with form material as detailed on Drawings. Provide uniform concrete finish to walls as detailed on Drawings. Lightly sandblast concrete surfaces where required to eliminate form seams and marks. Fill all snap tie holes to match surrounding finish.

    c. Repair surface defects, including tie holes, immediately after removing formwork.

3. Unexposed Form Finish: Rub down or chip off fins or other raised areas 114 inch (6 mm) or more in height.

3.04 CURING

A. Beginning immediately after placement, protect concrete from premature drying, from excessively hot or cold temperatures, and from mechanical injury. Maintain concrete with minimal moisture loss at relatively constant temperature for a period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than 7 days.

2. Hairline fissures and cracks developed in first ninety (90) days shall result in replacement of concrete.

B. Comply with requirements of ACI 308 and ASTM C171. Immediately after placement protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. Cover with white burlays-polyestylene sheet.

C. Initial curing shall be moist curing or moisture cover wring and shall continue for at least 188 emulative hours (not necessarily consecutive), during which the concrete has been exposed to air temperatures above 50 degrees F. Avoid rapid drying at the end of the curing period.

D. Use water that is free of impurities that could etch or discolor concrete surfaces.

E. Do not use liquid membrane curing compounds on surfaces which are to be covered with a coating material applied directly to the concrete or with a covering material bonded to the concrete, such as other concrete, liquid floor hardener, waterproofing, damp-proof flooring, painting, and other coatings and finish materials, unless otherwise acceptable to the Inspector.

F. Formed Surfaces: Cure by moist curing with forms in place for full curing period. Surfaces Not in Contact with Forms:

1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.

2. Begin final curing after initial curing but before surface is dry.

a. Moisture-retaining cover. Seal in place with waterproof tape or adhesive.

b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.05 WATERPROOF BARRIER

Place, protect and repair waterproof barrier according to manufacturer's written instructions.

3.06 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests as determined necessary by Owner, as specified in Section 01400.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

D. Compressive Strength Tests: ASTM C 39/C 39M. If a test is directed by Architect, Contractor shall mold and cure three concrete test cylinders. When tests are ordered by Architect, Contractor shall obtain test samples for every 100 cu yd (76 cu m) or less of each class of concrete placed.

E. At direction of Architect, perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.

3.07 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to the Owner and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Owner. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Contractor to be responsible for epoxy grouting repair of any cracks occurring in the concrete which exceed 1/8" as directed by Landscape Architect.

E. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of the Landscape Architect for each individual area.

3.08 COORDINATION

Bench posts, bike rack posts, drinking fountain, etc. shall be set in cured footings prior to placing concrete slab. Block outs will not be permitted.

END OF SECTION

SECTION 02630

STORM DRAINAGE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, material, equipment and services necessary to provide all work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section includes, but is not limited to the following:

1. Storm drainage piping, fittings, and accessories.
2. Connection of drainage system to existing drainage system.
3. Inlets.

B. Related Work Specified in Other Sections

1. SECTION 02324 – TRENCHING

C. Related Documents

1. ASTM:

a. ASTM D 3034 - Standard Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings; 2004a.

b. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2005.

1.02 SUBMITTALS

A. See Section 01330 - SUBMITTAL PROCEDURES.

B. Product Data: Provide data acknowledging that products meet requirements of standards referenced.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Project Record Documents:

1. Record location of pipe runs, connections, inlets, manholes and invert elevations.

2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.03 DELIVERY, STORAGE AND HANDLING

A. Do not store plastic structures, pipe and fittings in direct sunlight.

B. Protect pipe, fittings, and seals from dirt and damage.

C. Handle precast concrete pipe, manholes and other precast structures according to manufacturer's written instructions.

D. Protect imported bedding and backfill material from contamination by other materials.

PART 2 PRODUCTS

2.01 DRAINAGE PIPE MATERIALS

A. Plastic Pipe: ADS N-12, AASHTO M52 or approved equal, inside nominal diameter as indicated on Drawings.

B. Plastic Pipe Joint Seals: Pipe shall be joined using a bell & spigot joint meeting the requirements of AASHTO M252, AASHTO M294, or ASTM F2306.

C. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required. Fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306. Bell and spigot connections shall utilize a welded bell and valley or saddle gasket meeting the soil-tight joint performance requirements of AASHTO M252, AASHTO M294, or ASTM F2306.

2.02 PIPE ACCESSORIES

A. Line Marker: Provide warning detectable tape; permanent, bright-colored, continuous-printed plastic tape, intended for direct burial service; not less than 6 inches wide by 4 mils thick. Provide green tape with "CAUTION STORM LINE BURIED BELOW" in black letters.

2.03 CATCH BASINS

A. Catch Basins in turf areas: 18" or as indicated on Drawings.

B. Catch Basins in non-turf areas: 12" or as indicated on Drawings

C. 2.04 FLARED END SECTION

B. Flared end section: Precast concrete as indicated on Drawings. Hanson Pipe & Precast or approved equivalent.

2.05 BEDDING AND COVER MATERIALS

A. Pipe Bedding Material: As specified in Section 02324 – TRENCHING.
B. Pipe Cover Material: As specified in Section 02324 – TRENCHING.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 02324 – TRENCHING for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Lay piping beginning at low point of system, true to grades and alignment indicated on Drawings, with unbroken continuity of invert.

B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.

1. Plastic Pipe: Also comply with ASTM D 2321.

C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

D. Install continuous line marker 18 inches above top of pipe; coordinate with Section 02324 – TRENCHING.

3.03 INSTALLATION - CATCH BASINS

A. Provide as recommended by manufacturer.

3.04 PIPE PENETRATIONS

A. For pipe penetrations through existing manholes, core through, provide gasket around pipe, grout penetration on both sides and provide a minimum of 6 inches around collar outside of the manhole or inlet structure penetration.

3.05 TAP CONNECTIONS

A. Make connections to existing piping and underground structures so that finished Work will conform as nearly as practicable to requirements specified for new Work.

B. Into underground structures or pipes 24 inches and larger: Cut opening into unit sufficiently large to allow 3 inches of concrete to be packed around entering connection. Cut ends of connection passing through pipe or structure wall to conform to shape of and be flush with inside wall. On outside of pipe or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground. Provide 3000 pounds per square inch concrete. Use epoxy bonding compound as interface between new and existing concrete and piping materials.

C. Take care while making tap connections to prevent concrete or debris from entering existing pipe or structure. Remove debris, concrete, or other extraneous material, which may accumulate.

3.06 CLEANING

A. Clean pipe to be tested by propelling a snug fitting inflated rubber ball through the pipe with water to remove any debris.

3.07 LEAK TESTING

A. Testing of all portions of the storm drain system including manholes is required.

B. For either exfiltration or infiltration test, the maximum leakage shall not exceed 250 gallons per inch of pipe diameter per mile per 24 hours as measured over a period of 30 minutes minimum. Should the leakage exceed the maximum allowable rate, the contractor shall repair, overhaul, or rebuild the defective portion of the sewer line. After repairs have been completed by the Contractor, the line shall be retested as specified above.

C. Manholes shall be filled with water to the rim of the frame casting and shall lose no more than 2 inches over a period of 30 minutes.

D. The final test shall be performed after the line has been laid and all backfill placed and compacted. The Contractor, at his option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place and compacted. In the event that the exfiltration test prescribed above is impractical due to wet trench conditions, these portions of the storm drain line where such conditions are encountered will be tested for infiltration. The Owner's Representative shall determine whether the exfiltration or infiltration test will be used.

E. Even though the test for leakage is within the prescribed limits, the Contractor shall repair any obvious leaks.

F. Low pressure air testing may be used in lieu of water testing at the option of the Contractor. Water testing may be required by the Owner's Representative. The

following procedure shall be used for air testing:

1. Plug all pipe outlets with suitable test plugs. Brace each plug securely.

2. If the pipe to be tested is submerged in ground water, insert a pipe probe, by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.

3. Add air slowly to the portion of the pipe installation under test until the internal pressure is raised to 5.0 psig.

4. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any leakage is observed, bleed off air and make necessary repairs.

5. After an internal pressure of 5.0 psig. is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.

6. After the two minute period, disconnect the air supply and start stopwatch. The pressure of 5.0 psig. shall be maintained for 5 minutes.

7. As an alternate, the contractor may request the air testing procedure as presented in Section 306-1.4.4 of the 1997 edition of the "Greenbook" Standard Specifications.

3.08 DEFLECTION TESTING (PIPES GREATER THAN 8 INCHES ONLY)

A. After pipe installation and placement and compaction of backfill, but prior to placement of pavement, all PVC and HDPE pipe shall be cleaned and then mandrel tested for obstructions, such as, but not limited to, deflections, joint offsets and lateral pipe intrusions. A rigid mandrel shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe. All obstructions encountered by the mandrel shall be corrected by the Contractor. Obstructions due to deflection shall be corrected by replacement of the overdeflected pipe. Mechanical re-rounding is not permitted.

B. If a section of pipe fails to meet the mandrel test and is reinstalled and fails the second time, said section(s) of pipe shall be replaced with rigid pipe material approved by the Owner's Representative.

3.09 DISPOSAL

A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 02721

AGGREGATE BASE COURSE – SITE CONCRETE PAVING AND FOOTINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.
B. Paving aggregates.

1.02 RELATED SECTIONS

A. Section 02260 – Landscape Grading.
B. Section 02316 - Fill and Backfill.
C. Special Provisions: Aggregate Base, Asphalt Concrete, Storm Drain Pipe, Sanitary Sewer, Sewer and Storm Drain Manholes, Potable Water Supply and Miscellaneous Concrete Construction
D. Section 02515 – Site Concrete
E. Section 02811 – Irrigation: Trenching and Backfill

1.03 REFERENCES

A. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 1996a.
B. ASTM D 1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 1991 (Reapproved 1998).
C. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System); 1998.
D. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1996.
E. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1996.

1.04 SUBMITTALS

A. Materials Sources: Submit name of imported materials source.
B. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
C. Compaction Density Test Reports.

1.05 PROJECT CONDITIONS

A. Provide sufficient quantities of aggregate to meet project schedule and requirements.

When necessary, store materials on site in advance of need.

B. Verify that survey benchmarks and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base: Coarse aggregate, conforming to Section 26 of the State of California Highway Department Standards for 3/8-inch maximum Class 2 Aggregate Base.

2.02 SOURCE QUALITY CONTROL

A. If tests indicate materials do not meet specified requirements, change material and retest.
B. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify subgrade has been inspected, gradients and elevations are correct, and is moist but not pumping.

3.02 PREPARATION

A. Correct irregularities in subgrade gradient and elevation by scarifying, reshaping, and re-compacting.
C. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

A. Under Concrete Paving and Footings:
   1. Place aggregate base to a total compacted thickness as indicated on the Project Drawings.
   2. Compact to 95 percent of maximum dry density.

3.04 TOLERANCES

A. Variation From Design Elevation: Within 0.05 feet.

3.05 FIELD QUALITY CONTROL

A. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D2922 and ASTM D3017.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest.
C. Proof roll compacted aggregate at surfaces that will be under paving.

3.06 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition in accordance with Section 02260.

END OF SECTION

SECTION 02764

PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within cement concrete pavement.
2. Joints between cement concrete and asphalt pavement.

B. Related Sections include the following:

1. Section 02515 Site Concrete for constructing joints in concrete pavement.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Qualification Data: For Installer and testing agency.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet or covered with frost.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Landscape Architect from manufacturer's full range.

2.3 COLD-APPLIED JOINT SEALANTS

A. Multicomponent Jet-Fuel-Resistant Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:

1. Urethane Formulation: Type M; Grade P; Class 12-1/2; Uses T, M, and, as applicable to joint substrates indicated, O.

a. Products:

1) Pecora Corporation; Urexpan NR-300.

2. Coal-Tar-Modified Polymer Formulation: Type M; Grade P; Class 25; Uses T and, as applicable to joint substrates indicated, O.

a. Products:

1) Meadows, W. R., Inc.; Sealtight Gardox.

3. Bitumen-Modified Urethane Formulation: Type M; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

a. Products:

1) Tremco Sealant/Waterproofing Division; Vulkem 202.

B. Single-Component Jet-Fuel-Resistant Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

1. Products:

a. Sonneborn, Div. of ChemRex, Inc.; Sonomeric 1.

C. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.

1. Products:

a. Crafco Inc.; RoadSaver Silicone.
b. Dow Corning Corporation; 888.

D. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

1. Products:

a. Crafco Inc.; RoadSaver Silicone SL.
b. Dow Corning Corporation; 890-SL.

E. Multicomponent Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

1. Products:

a. Meadows, W. R., Inc.; Sof-Seal.

2.4 HOT-APPLIED JOINT SEALANTS

A. Jet-Fuel-Resistant Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3569.

1. Products:

a. Crafco Inc.; Superseal 444/777.
b. Meadows, W. R., Inc.; Poly-Jet 3569.

B. Jet-Fuel-Resistant Sealant for Concrete and Tar Concrete: Single-component formulation complying with ASTM D 3581.

1. Products:

a. Crafco Inc.; Superseal 1614A.
b. Meadows, W. R., Inc.; Poly-Jet 1614.
c. Meadows, W. R., Inc.; Poly-Jet 3406.
d. Meadows, W. R., Inc.; Poly-Jet 3569.

C. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.

1. Products:

a. Crafco Inc.; Superseal 444/777.
b. Meadows, W. R., Inc.; Poly-Jet 3406.

D. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

1. Products:

a. Koch Materials Company; Product No. 9005.
b. Koch Materials Company; Product No. 9030.
c. Meadows, W. R., Inc.; Sealtight Hi-Spec.

2.5 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

2.6 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 02811

IRRIGATION

PART 1 - GENERAL

1.01 CONDITIONS

A. The general provisions of the Contract, including General and Supplementary Conditions and Special Provisions (if any) apply to the work specified in this Section.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, processes, and equipment necessary to complete the irrigation system work as indicated on the Drawings and specified herein.

B. Test the entire irrigation system to assure proper operation.

C. Furnish all labor, materials, and equipment necessary to restore all disturbed areas resulting from the work as indicated on the Drawings and specified herein.

D. All incidental parts, which are not shown on the plans or specified herein and are necessary to complete or modify the existing system shall be furnished and installed as though such parts were shown on plans or specifications. All systems shall be in satisfactory operation at the time of completion.

1. Related work specified in other sections:

a. Section 01600 – **PRODUCT REQUIREMENTS**

b. Section 01780 - **CLOSEOUT SUBMITTALS**

c. Section 02100 - **DEMOLITION**

d. Section 02905 - **LANDSCAPE INSTALLATION**

e. Section 02970 - **LANDSCAPE MAINTENANCE**

1.03 QUALITY ASSURANCE & REQUIREMENTS

A. Permits and Fees: The Contractor shall obtain and pay for all permits and all observations as required.

B. Manufacturer's Directions: Manufacturer's directions and detailed Drawings shall be followed in all cases where the manufacturers of articles used in this Contract furnish directions covering points not shown in the Drawings and Specifications

C. Ordinances and Regulations

A. All local, municipal and state laws, rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these Specifications and their provisions shall be carried out by the Contractor.
B. All rules and regulations governing or relating to the California Code of Regulations, Title 23, Division 2, Chapter 2.7, 2015 Updated Model Water Efficient Landscape Ordinance are hereby incorporated into and made a part of these Specifications and their provisions shall be carried out by the Contractor.

C. The materials and work of this section shall conform to all applicable provisions of the latest editions of the Uniform Plumbing Code, the National Electrical Code, and all codes properly governing the materials and work at the project site.

D. All electrical materials and work shall conform to California Administrative Code, Title 23, Part 3, Basic Electrical Regulations, and Article 18 E 110-16.

E. Anything contained in these Specifications shall not be construed to conflict with any of the above rules and regulations or requirements of the same. However, when these Specifications and Drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of the Specifications and Drawings shall take precedence.

D. Explanation of Drawings

1. Not all offsets, fittings, sleeves, main line, lateral, etc., which may be required are shown on plans. Carefully investigate the structural and finish conditions affecting all the work and plan the work accordingly furnishing such fittings; etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. Due to the scale of the Drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required to complete the irrigation system.

2. Before proceeding with any work, the Contractor shall check and verify all dimensions, quantities, pressures and flows and shall immediately inform the District of any discrepancy between the drawing and/or the Specifications and actual conditions. No work shall be done in any area where there is such a discrepancy until the District has given written approval for the same. The Contractor shall assume full responsibility for work installed without approval.

3. The materials and work shall be installed in such a manner as to avoid conflicts between irrigation system and planting, existing or proposed utilities, and all other construction features.

4. Contractor shall verify prior to and during construction, that his contract documents reflect the latest revisions and change orders. Contractor shall be able to produce such documents at the request of the District.

5. Pipe sizes indicated on the Drawings are minimum allowable.

1.04 EXISTING CONDITIONS

A. The Contractor shall exercise due care to protect all existing facilities, structures and utilities both above ground and underground on the site.

B. The contractor shall also exert every effort to maintain amenities, including specimen tress and natural areas integral to the aesthetic of the park design.

C. Information on the Drawings, relative to existing conditions, is approximate only. Deviations found necessary during construction to conform to actual conditions, as approved by the District, shall be made without additional cost.

D. Where it is necessary to excavate in areas of existing utilities, the contractor shall pothole to confirm exact locations of existing utilities. Exercise extreme care in excavating and working near existing utilities. The Contractor shall be responsible for all damages to existing utilities that are caused by his operation or neglect. In case of interruption of utilities caused by the contractor's operations or neglect, the contractor shall be responsible to have the utilities in service as soon as possible and in no case shall the interruption be longer than a twenty-four (24) hour period. In such case that the contractor needs more than a twenty-four (24) hour period, prior approval shall be acquired from the District in writing.

E. Excavation in proximity to existing trees shall conform to the Tree Protection Measures per Contract Documents.

1.05 EXISTING IRRIGATION SYSTEM

A. All existing sprinklers, rotors, controllers, quick coupler valves, undamaged utility boxes, remote control valves, isolation valves shall be removed and salvaged by the Contractor. Deliver only salvageable items to District maintenance yard in stackable plastic bins. All salvaged products shall be inventoried by Contractor prior to delivery. All other items shall be disposed of by the Contractor.

B. Existing pipelines shall be abandoned in place except in those areas designated to retain and protect. If an existing irrigation pipe is encountered during the installation of new pipe, a section of the existing pipe shall be cut and removed. Remove two (2) feet of the existing pipeline on both sides of the new pipe and/or to a depth of eighteen (18) inches, whichever comes first.

1.06 SUBMITTALS

A. Material List

1. Contractor shall furnish the articles, equipment, materials, or processes specified by name in the Drawings and Specifications. Product names are used as standards

only; other materials or methods shall not be used unless approved in writing by the District. Burden of proof as to equality of proposed material shall be on the Contractor; the District's decision is final. Only one request for substitution shall be considered for each item. Equipment capacities specified are minimum acceptable.

2. A complete material list (6 copies) shall be submitted to the District for approval prior to performing any work. The material list shall clearly identify the manufacturer, model number and description of materials and equipment to be used, including but not limited to the following:

   a. Irrigation Controller and Accessories
   b. Hand Held Remote Control
   c. Isolation Valves
   d. Master Valve and Flow Sensor
   e. Remote Control and Drip Valves
   f. 2-Wire Valve and Sensor Decoders
   g. Concrete Valve Boxes and Security Lids
   h. Gear Drive Rotors
   i. Pop Up Sprinklers and Nozzles
   j. Bubblers and Riser Assemblies
   k. Drip Irrigation Tubing and Fittings
   l. Swing Joint Assemblies
   m. PVC Gasketed Main Line Pipe
   n. Main Line Fittings and Joint Restraints
   o. PVC Solvent Weld Lateral Pipe and Fittings
   p. PVC and HDPE Sleeves
   q. PVC Conduit
   r. PVC Solvent Cement and Primer
   s. 2-Wire Decoder Cable
   t. Water Proof Wire Connectors
   u. Controller and Decoder Earth Ground Systems

3. The contractor shall provide additional submittals as required for products not listed above but which are used on site. Approval of submittals is required before installation.

4. Equipment or materials installed or furnished without prior approval of the District shall be rejected and the Contractor shall be required to remove such materials from the site at his own expense.

5. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Drawings and Specifications based on the information or samples submitted.

B. Record Drawings

1. The Contractor shall dimension from two (2) permanent points of reference, building corners, sidewalks, or road intersections, etc., the location of the following items:

    a. Connection to Irrigation and Potable Water Lines (Note Depth)
    b. Electrical Power Connection and Conduits (Note Depth)
    c. Irrigation Controller
    d. Main Line Valves – Isolation, Quick Coupler and Air Release
    e. Master Valves and Flow Sensors
    f. Remote Control and Drip Valves
    g. Routing of irrigation pressure lines; dimension maximum 100' along routing and at turns in direction and utility crossovers. (Note Depth)
    h. Routing of conduit and 2-wire decoder cable when not adjacent to main line.
    i. Main Line, Lateral and Electrical Sleeves at both ends (Note Depth)
    j. Electric pull/splice boxes (note decoder identification addresses)
    k. Other related equipment as directed by the District.

2. Two (2) weeks prior to the date of the final observation, the Contractor shall deliver reproducible record drawings and digital media to the Landscape Architect for review. Delivery shall not relieve the Contractor of the responsibility of furnishing required information that may be omitted from the plans or digital media or from the requirements of the Close Out Documents.

C. Controller Charts

1. The District shall approve record Drawings before controller charts are prepared.

2. Provide one (1) controller chart for each controller supplied.

3. The chart shall show or explain the area controlled by the automatic controller and shall be the maximum size that the controller door will allow.

4. The chart shall be either a reduced drawing or a written description of the actual record drawing system. In the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that is readable.

5. When completed and approved, the chart shall be hermetically sealed between two (2) pieces of plastic, each piece being a minimum ten (10) mils thick.

6. These charts shall be completed and approved prior to final observation of the irrigation system.

D. Operation and Maintenance Manuals

1. Prepare and deliver two (2) operation manuals as specified and as follows:

    a. Approved irrigation material list as described in Section 1.05.A.2
    b. Parts lists for approved irrigation material list.

c. Operation manuals for approved irrigation material list.

3. Guarantee Statement for Irrigation System

4. Landscape Irrigation Water Audit

E. Before final observation can occur, the above-mentioned material submittals, record drawings, controller charts, operations and maintenance manuals, guarantee statement for irrigation system, central control certificate and landscape irrigation water audit shall be turned over to the District.

1.06 Equipment to be Furnished:

A. Irrigation Products to be Furnished

1. Supply as a part of this Contract the following tools:

a. Two (2) key sets for locking irrigation controller.
b. Two (2) valves of each size and type used.
c. Two (2) decoders of each type used.
d. Five (5) rotors of each type used.
e. Five (5) pop up sprinklers of each type used.
f. Five (5) complete nozzle sets of each type used.
g. Five (5) bubblers of each type used.
h. One Hundred (100) feet of drip tubing for each type used.
i. Ten (10) drip emitters for each type used.
j. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler used
k. Two (2) sets of special tools required for removing, disassembling and adjusting each type of joint restraint used.
l. Two (2) lock and key sets for controller enclosures (keyed as per District specifications)
m. Two (2) quick coupler keys and matching hose swivels
n. Two (2) 60" isolation valve opening keys
o. Four (4) Security keys for concrete valve boxes
p. Two (2) hand-held remote-control transmitters and cases
q. Two (2) hand-held decoder programmers

2. The above-mentioned equipment shall be turned over to the District at the conclusion of the project. Written evidence that the District has received materials must be provided to the Landscape Architect prior to scheduling final observation.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

Handling of PVC Pipe and Fittings: The Contractor is cautioned to exercise care in handling, loading, unloading, and storing of PVC pipe and fittings. All PVC pipe shall be transported in a vehicle that allows the length of pipe to lie flat so as not to subject it to

undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded and if installed replaced with new.

1.08 GUARANTEE

1. The guarantee for the irrigation system shall be made in accordance with the form shown on the following page. A copy of the guarantee form shall be included in the operations and maintenance manual. The guarantee form shall be re-typed onto the Contractor's letterhead and contain the following information:

GUARANTEE FOR IRRIGATION SYSTEM

We hereby guarantee that the irrigation system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the Drawings and Specifications, ordinary wear and tear and unusual abuse or neglect excepted. We agree to repair or replace any defects in material or workmanship, which may develop during the period of one (1) year from date of final acceptance and to repair or replace with originally specified materials. Any damage resulting from the repairing or replacing of such defects shall be replaced and repaired by the contractor at no additional cost to the District. We shall make such repairs or replacements within a 48-hour period, after receipt of written notice. In the event of our failure to make such repairs or replacements within said period after receipt of written notice from the District, we authorize the District to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT:_____

LOCATION:_____

SIGNED:_____

ADDRESS:_____

PHONE:_____

DATE OF ACCEPTANCE:_____

PART 2 - PRODUCTS

2.01 MATERIALS

A. Trench Backfill

1. Native Material

   a. Native backfill material, if approved by the District, shall be used for backfill material.

   b. Native Backfill: Prepared as necessary to be non-expansive, free of debris, organic material and lumps larger than three (3) inches, rocks larger than two (2) inches,

   c. Unless otherwise specified in the Special Provisions, the Contractor has the option to use imported granular material for trench backfill in place of native material excavated at the work site.

      1.) The optional use of imported granular material for trench backfill will be at the Contractor's expense.

2. Imported Soil

   a. Imported Backfill: Non-expansive soil, free of debris, organic material and lumps larger than three (3) inches, rocks larger than two (2) inches, with a liquid limit no greater than 40 and a plasticity index no greater than 15.

3. Graded Sand

   a. Graded sand backfill must be free from vegetable matter, lumps, balls of clay, or adherent films of clay, and must have a minimum Cleanliness Value of 60 as determined by California Test 227.

   b. The percentage composition by weight of graded sand must conform to the following gradations:

Sieve Size	Percentage Passing by Weight
9.5 mm (3/8")	100
4.75 mm (#4)	92-100
2.36 mm (#8)	90-100
1.18 mm (#16	80-100
600 µm (#30)	65-100
300 µm (#50)	40-80
150 µm (#100)	0-40
75 µm (#200)	0-12

4. Crushed Rock or Gravel

    a. Crushed rock or gravel backfill material shall be graduated so that 100 percent will pass the 3/4 inch sieve and not more than 15 percent will pass the number 8 sieve.

    b. Clean crushed rock must have a minimum Cleanliness Value of 60 as determined by California Test 227. At least 75 percent of the crushed rock particles must have 2 or more fractured faces.

B. Woven Geotextile Fabric

1. The woven geotextile fabric must be a high modulus woven fabric consisting of long chain polymeric monofilaments, slit film tapes, or multifilaments of tape and nonwoven yarn of polypropylene, polyester or nylon, and must be inert to commonly encountered chemicals, rotproof and resistant to ultraviolet light exposures, insects, and rodents.

2. The fabric must be woven into a stable network and the edges of the fabric must be selvedged or surged in such a way that fabric will not unravel or fray during installation or usage.

3. The geotextile must conform to the physical property requirements as below:

    a. Grab tensile strength (any direction), lb. ASTM D 4632 200 lbs.
    b. Weight, oz/yd3 ASTM D 5261 6.0 oz/yd3
    c. Permittivity, sec-1 ASTM D 4491 0.5 sec-1
    d. Mullen Burst strength, psi ASTM D 3786 400 psi
    e. The fabric must have an Equivalent Opening Size no larger than U.S. Standard Sieve Number 50 as determined by U.S. Corps of Landscape Architects Specification CW-02215.

C. Irrigation Pipe Sleeve

1. Irrigation Sleeve 4" and smaller shall be PVC Schedule 40 with solvent-weld joints.

    a. Pipe shall be made from NSF approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1785. All pipes shall meet requirements set forth in Federal Specification PS-21-70. (Solvent-weld Pipe)

2. Irrigation Sleeve 6" and larger shall be corrugated HDPE with smooth interior wall.

    a. HDPE shall be made from high-density polyethylene with an integrally formed smooth interior conforming to AASHTO M252, AASHTO M294, Type S.

D. PVC Pipe and Fittings

1. Main Line Pressure Pipe and Fittings.

   a. Pressure main line piping four (4) inch and larger shall be PVC Class 200, rubber ring joint type.

      1.) Couplings with grooves for sealing rings either shall be a separate machined part with two (2) sealing rings or manufactured as an integral part at one end of each pipe length. Pipe shall be made from an NSF (National Sanitation Foundation) approved Type I, Grade I, PVC compound conforming to ASTM resin specification D2241. All pipes shall meet requirements as set forth in Federal Specification PS22-70, with an appropriate standard dimension ratio (S.D.R. Pipe).

      2.) Lubricant for assembling gasketed pipe and fittings shall be as per manufacturer's specifications.

      3.) Main line fittings and valves two and one half (2-1/2) inch and larger shall be mechanically restrained using integral joint restraints or approved equal.

   b. Pressure main line piping three (3) inch to two and one half (2-1/2) inch shall be PVC Class 315 and two (2) inch and smaller shall be PVC Schedule 40.

      1.) Main line fittings three (3) inch and smaller shall be PVC Schedule 80

   c. All PVC pipe shall be marked continuously and permanently with the following information: Manufacturer's name, nominal pipe size, schedule or class of pipe, pressure rating in P.S.I. extrusion, NSF approval and date of extrusion.

   d. All PVC fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.

2. Lateral Non-Pressure Pipe and Fittings

   a. PVC pipe 2-1/2 inch and larger shall be PVC Class 315.

   b. PVC pipe 2 inch and smaller shall be PVC Schedule 40.

   c. Pipe shall be made from NSF approved Type 1, Grade PVC compound conforming to ASTM resin specification 1785. All pipes shall meet requirements as set forth in Federal Specification PS-21-70. (Solvent-weld pipe).

   d. Lateral pipe fittings downstream of remote control valves shall be solvent welded PVC Schedule 40 unless otherwise noted in details and drawings.

E. Main Line Joint Restraints

1. All gate valves, ductile iron bends, reducers, tees and pipe bell and gasket joints adjacent to restrained joints shall be mechanically restrained in accordance to the manufactures recommended design criteria and guide. Concrete thrust blocks are not to be used.

2. The mechanical joint restraint shall be capable of securing the PVC pipe directly to the gate valve, ductile iron bends, reducers and tees without the use of bolts, links and adapters.

3. Joint restraints shall be manufactured from ductile iron, grade 65-45-12 in accordance with ASTM A-536.

4. Bolts and nuts used on joint restraints shall be provided as part of the restraint assembly.

5. All joint restraints shall be installed using methods recommended by the manufacturer. All bolts and nuts shall be tightened as per manufacturer's recommended torque ratings.

F. Main Line Detectable Marking Tape

1. Detectable marking tape shall consist of a 5.0 mil (0.005") thickness, five-ply composition, ultra-high molecular weight, 100 percent virgin polyethylene and acid, alkaline and corrosion resistant.

2. The tape tensile strength is in accordance with ASTM D882-80A and will not be less than 7800 PSI. The tape will have a 2.0 mil (0.0020") solid aluminum foil core, encapsulated within 2.55 mil (0.00255") polyethylene backing.

3. Tape width shall be three (3) inch minimum width or as specified by manufacturer for pipe size.

4. Detectable marking tape for irrigation water shall be blue in color with "Caution: Irrigation Water Line Buried Below"

G. Concrete

1. ASTM Class B concrete shall be used for fill concrete.

2. Concrete shall have a 3,500-PSI compressive strength at 28 days and shall have maximum water to cement and dispersing agent ration of 56%. Concrete shall have a minimum cement content of 470 lbs. (5 bags) per cubic yard concrete. Nominal maximum size of coarse aggregate shall be three-quarter (3/4) inch.

H. PVC Threaded Nipples:

1. PVC Schedule 80 nipples shall be produced from extruded stock grade PVC compounds.

    a. No molded nipples shall be used.

    b. PVC Schedule 80 nipples shall be made from NSF approved PVC compound conforming to ASTM D1784, Cell Classification 12454

I. Manual Valves

1. All mainline valves shall be resilient wedge and conform to AWWA C153 standards.

    a. Material shall be ductile iron per ASTM A-536, Grade 65-45-12.

    b. Epoxy coating on all interior and exterior surfaces shall be fusion bonded epoxy, 12-14 mil thickness.

    c. Gate valves shall be available in spigot x bell and bell x bell models to mechanically connect to fittings or plastic pipe. Valve bell end shall be deep bell, gasket and equipped with cast joint restraint clamps to securely fasten to plastic pipe.

    d. Restraints shall have blunt cast serrations. Machined threaded restraints will not be allowed.

    e. Valves shall have a shroud around the 2" operating nut to accept IPS PVC sleeve which provides dirt-free access to actuate the valve.

2. Valves two (2) inch and smaller shall be bronze, full port ball valve with threaded ends.

    a. Ball valves shall be equipped with a cast bronze cross or tee handle.

J. Quick Coupling Valves

1. Quick coupling valves shall have a brass two-piece body designed for working pressure of 150 P.S.I. operable with quick coupler key. Key size and type shall be as shown on the Drawings.

K. Remote Control Valve

1. Remote control valves shall be of the same type, manufacturer and model shown on drawings.

2. Remote control valves shall be operated by a 2-wire decoder with a separate decoder address for each valve station and be of the same type, manufacturer and model as shown on the drawing.

3. Remote control valves shall be labeled with a valve identification tags of the same type, manufacture and model shown on drawings.

L. Valve Identification

1. Remote control valve tags shall be of the same type, manufacturer and model shown on drawings.

2. Remote control valve tags shall be manufactured from polyurethane Behr Desopan, with a reinforced attachment hole and will be 2-1/4" x 2.3/4" in size.

   a. Remote control valve identification tags shall be yellow in color with double sided stamped controller and valve designation.

   b. Manual and remote-control valve identification tags shall be blue in color with double sided stamped "Non-Potable Water" on both sides.

B. Wiring

1. Two-wire cable shall be a twisted, solid-core wire suitable for direct burial, color-coded red and blue.

2. All connections in the two-wire path shall be made with 3M DBRY-6 waterproof connectors or approved equal.

3. Two-wire cable earth grounding shall be per manufacture's specifications.

C. Irrigation Controller

1. The irrigation controller shall be of the same type, manufacture and size as shown on the drawing.

2. The irrigation controller shall operate the remote-control valves using a two-wire path.

3. The irrigation controller shall have a minimum of six (6) sensor outputs.

4. The irrigation controller shall be equipped with two (2) hand held remote programmers that use wireless induction to program and communicate with decoders in the field.

5. Irrigation Controller shall have a five (5) year manufacturer's warranty.

D. Master Valve and Valve Flow Sensor Assembly

1. The master valve and flow sensor assembly shall be of the same type, manufacture and size as shown on the drawing.

2. The master valve shall be operated by a 2-wire decoder.

3. The Flow Sensor shall be connected to the controller through a 2-wire path sensor decoder as per manufacture specification.

E. Earth Ground

1. Earth Grounding for electronic irrigation controller shall be made in accordance with Article 250 of the National Electrical Code (NEC) and manufacturer written specifications. At the very minimum, the grounding circuit shall include a copper clad steel ground rod, a solid copper ground plate and one hundred (100) pound of PowerSet earth contact material or approved equal.

2. Ground Rods shall be 5/8" diameter by 10' length copper clad with a surface area of 238 square inches.

3. Copper Ground Plates shall be 12" by 36" by 1/16" solid copper with a surface area of 870 square inches.

   a. Copper Ground Plates shall come with 25 feet of 6AWG copper wire welded to the plate.

   b. Copper Ground Plates shall conform to N.E.C. requirements.

4. Bare Copper Wire shall be soft-annealed, uncoated copper, 6AWG and conforming to UL standard 719.

   a. Bare Copper Wire shall be permanently welded to ground rods and ground plates, so the connection doesn't loosen or corrode.

   b. Exothermic reaction welding process shall be used and shall conform to N.E.C. requirements.

5. Earth Contact Backfills shall be superior conductive material, non-hardening or hardening such as PowerFill or PowerSet or approved equal.

F. Irrigation Heads

1. All irrigation heads shall be of the same size, type and deliver the same rate of precipitation with the diameter (or radius) of throw, pressure, and discharge as shown on the plans and/or specified herein or approved by the District.

2. Rotor heads shall be gear drive with stainless steel riser and factory installed check valve.

3. Pop Up Sprinkler bodies shall be equipped with pressure regulation, heavy-duty spring and factory installed check valve.

    a. Pop Up Sprinklers shall come equipped with rotary nozzles and matched precipitation.

4. All irrigation heads of similar functions shall be of common manufacture and shall be marked with the manufacturer's name and model identification in a position where they may be identified without being removed from the system.

G. Valve and Electric Boxes

1. Valve boxes installed in decomposed granite areas shall be tan colored; valve boxes installed in planter areas shall be green colored.

2. Valve boxes shall be per plans and details with bolt down kit and a skid resistant marked surface.

3. Valve box lids shall be per plans with diamond plated surface texture with a locked and secure improved wing design securely locking the cover in place from inside the enclosure.

    a. Valve box lids shall come equipped with a vandal resistant security bolt and a specialized key to open.

    b. Valve box lids shall have a welded identification plate attached by the manufacturer to say irrigation.

PART 3 - EXECUTION

3.01 GENERAL

A. Appoint a competent resident superintendent to be onsite whenever the WORK is in progress. The superintendent shall not be replaced without notice to the Landscape Architect.

B. Contractor is responsible for locating and avoiding underground utilities, for notifying all appropriate agencies prior to beginning excavation, and for any damage caused by Contractor. Contractor is required to notify Landscape Architect and the utility company should there be any damage to utilities.

3.02 SITE CONDITIONS

1. Contractor shall protect all existing site development including, but not limited to, existing buildings, equipment, underground utilities, walls, materials, etc. Any existing site development damaged by willful or negligent acts of Contractor or

any of Contractor's employees shall be replaced or repaired at no expense to District and in a manner satisfactory to Landscape Architect before Project acceptance is given. This provision applies to onsite damage as well as to that which may occur to adjacent properties

2. All scaled dimensions are approximate. The Contractor shall check and verify all site dimensions and notify the District if site conditions have changed from those specified in the drawings.

3. The Contractor shall check and verify all site water and electrical services and notify the District if site conditions have changed from those specified in the drawings.

4. The Contractor shall carefully check all grades to satisfy him that he may safely proceed before starting work on the irrigation system.

5. The contractor shall obtain permits and call for inspections as required by local codes and regulation. All installations shall conform to local codes and accepted construction practices.

3.03 PREPARATION

A. Physical Layout

1. Locations on Drawings are diagrammatic and approximate only and shall be changed and adjusted as necessary and as directed by the District to meet existing conditions and obtain complete water coverage.

2. Prior to installation, the Contractor shall stake out points of connection, power connections to controllers, location of mainlines, valve groupings and obtain review by the District before installation. The District prior to installation shall approve all layouts in writing. If equipment is incorrectly located without said approval, it is the Contractor's responsibility to relocate it as per the District's directions without additional cost.

3. Prior to installation in Turf Fields, the Contractor shall stake out points of connection to main line, location of mainlines, valves groupings and sprinkler heads that define the layouts of the Turf Fields and obtain review by the District before installation.

4. The Contractor shall install and extend the system as shown on the Drawings, and as necessary to carry out the intent of the Drawings and Specifications.

3.03 WATER, ELECTRICAL AND TELEPHONE SERVICES

A. Water Supply

1. Coordinate with the District the irrigation water supply point of connection as indicated on the Drawings. Field verify connection location and size. The

contractor is responsible for any changes caused by actual site conditions. Notify the District of any discrepancies prior to beginning construction.

B. Electrical Supply

1. Contractor shall provide all materials and connections to supply electrical power to the irrigation controller(s) and other electrical components as needed.

2. Connection shall be made at approximate location(s) as indicated on the Drawings. The Contractor is responsible for minor changes caused by actual site conditions and for the coordination of all electrical service connections to the controllers.

3. A licensed Electrical Contractor shall perform electrical work. Materials and workmanship for electrical service shall conform to the latest edition of the National Electric Code and local codes, ordinances and governing authorities having jurisdiction.

3.04 INSTALLATION

A. Trenching

1. Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on the Drawings and as noted.

2. Provide for twenty-four (24) inches cover for all pressure lines. Contractor shall be responsible to review Grading Plan to control depth of mainline.

3. Provide eighteen (18) inches cover for rotor and sprinklers on non-pressure lines.

4. Provide for a minimum of twelve (12) inches cover for drip manifolds on non-pressure lines.

5. Provide for twenty-four (24) inches cover for all control wiring.

6. Provide twenty-four (24) inches of cover for all pressure lines, non-pressure lines and control wiring under auto traffic areas.

7. Trench width shall be as needed to provide minimum horizontal clearance between pipes and minimum of four (4) inches of clearance between edge of pipes and edges of trench.

8. No pipe shall be laid directly over another pipe.

B. Laying and Jointing Geotextile

1. Placed geotextile directly on prepared subgrade in the trench to conform loosely to the shape of the trench. The geotextile shall be laid flat, but not stretched on the soil, avoid folds and creases.

2. Overlap geotextile side-to-side minimum one and one half (1-1/2) feet. Apart from the one longitudinal overlap no longitudinal joints shall be permitted.

    a. Curves may be accomplished by folding or cutting the fabric to conform to the curve.
    b. Staple overlap at four (4() foot longitudinal intervals using six (6) inch galvanized U-shaped landscape pins.

3. Successive sheets shall be overlapped to form transverse field splices. The splices shall have a minimum overlap of 500 mm and shall be anchored with securing pins to ensure this required overlap is maintained. Alternatively, sewn joints will be accepted subject to the approval of the Landscape Architect.

4. Where outlet pipe passes through the geotextile, a separate piece of geotextile of sufficient size shall be wrapped around the pipe and flared against the side of the geotextile wrapped pipe.

C. Backfilling

1. Excavate bottom of trench to uniform grade to achieve stable trench conditions and satisfactory compaction of foundation or bedding materials. Pipes must have firm, uniform bearing for the entire length of each pipe line. Wedging or blocking of pipe will not be permitted

2. Place Geotextile to prevent particle migration from the in-situ into open graded embedment materials.

3. Place sand backfill six (6) inches in depth below the pipe and compact to 85 percent of the maximum dry density determined according to ASTM D 698.

4. Manually spread sand backfill around the pipe to provide uniform bearing and side support when compacted. Perform placement and compaction directly against the undisturbed soils in the trench sidewalls.

5. Place sand backfill six (6) inches in depth above the pipe and compact by at least two passes manual tamping to 85% relative compaction. Ponding or jetting methods will not be permitted.

6. Backfill lateral lines with approved backfill material. Backfill material shall be free from organic materials, large clods of earth or rocks larger than three (3) inches in diameter, trash, debris, rubbish, broken cement, asphalt material or other objectionable substances.

7. If settlement occurs and subsequent adjustments in pipe, valves, sprinklers heads, lawn or planting, or other construction are necessary, the Contractor will make all the required adjustments at Contractor's expense.

D. Trenching and Backfilling Under Paving

1. Trenches located under areas where paving, asphaltic concrete or concrete shall be installed, shall be backfilled with sand, a layer six (6) inches below the pipe and six (6) inches above the pipe and compacted in layers to 85% compaction, using manual or mechanical tamping devices. All trenches shall be left flush with the adjoining grade. The Contractor shall set in place; cap and pressure test all piping under paving prior to the paving work.

2. Generally piping under existing walks is done by jacking, boring or hydraulic driving, but where any cutting or breaking of sidewalks and/or concrete is necessary, it shall be done and replaced by the Contractor as part of the Contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the District in writing. No hydraulic driving shall be permitted under concrete paving.

E. Sleeving

1. Sleeving shall be installed for irrigation pressure main line pipe, non-pressure lateral pipe and electrical wiring that crosses pavement, walkways, paths, mow curbs, concrete, and other hardscape elements as needed whether shown on drawing or not.

2. Install irrigation and electrical sleeving as needed whether indicated on the Drawings. Contractor shall coordinate the installation of sleeving with the work of other trades. Sleeving shall extend a minimum of six (6) inches past hardscape.

3. Sleeves shall be sized to easily accommodate piping and/or control wiring as called for in the drawings leaving a minimum of 25% void space inside sleeve.

   a. The contractor shall be responsible to verify sleeving sizes based on field verification of pipe and wire crossings.

4. Separate sleeves shall be provided for:
   a. Main line and lateral piping.
   b. 120V electric service
   c. Irrigation 2-wire decoder cable
   d. Irrigation ground wire.

5. Sleeves shall have both ends capped during installation to prevent dirt and debris from entering the sleeve.

6. Identify location of sleeve ends from two permanent points of reference and mark on record drawings.

7. When utilizing existing sleeving, the contractor will remove existing pipe and wire and remove debris from sleeve prior to installing new irrigation components.

F. PVC Pipe

1. Routing of irrigation pipe as indicated on the Drawings is diagrammatic. Install lines, stub outs and valve manifolds to conform to the details shown on the drawings.

2. Install irrigation main line a minimum of five (5) feet from tree locations to avoid conflict with mature rooting systems.

3. Install no multiple assemblies on plastic lines. Provide each assembly with its own outlet.

4. Changes in directions and depth on irrigation main line shall be made with 45° bends. No 90° bends shall be used.

5. Install all assemblies specified herein in accordance with respective detail. In absence of detail Drawings or specifications pertaining to specific items required to complete work, provide shop drawing in accordance with best standard practice to Landscape Architect for review and approval prior to installation.

6. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation shall be as recommended by the pipe and fitting manufacturer.

7. PVC pipe shall be installed so that there will be a small amount of excess length in the pipe to compensate for contraction and expansion of the pipe. This shall be accomplished by "snaking" the pipe in the trench during installation.

8. Center load pipe with small amounts of backfill to prevent arching and slopping under pressure. Leave joints exposed for inspection during testing.

9. No water shall be permitted in the pipe until inspections have been completed and a period of at least 24 hours has elapsed for solvent weld setting and curing.

10. Plastic to metal connections shall be made with plastic male adapters and female metal adapter, hand tightened, plus one turn with a strap wrench. Teflon tape or approved equal shall be used on all threaded PVC to metal joints.

11. Gasket Joint: Use gasket lube as recommended by pipe manufacturer.

12. Solvent Weld Joint: The Contractor must make solvent weld joints with non-synthetic bristle brush in the following sequence:

a. Apply a liberal, even coat of purple PVC primer to the pipe and fitting immediately before applying the solvent.

b. Apply a liberal even coat of solvent to the inside of the fitting and then to the outside of the pipe, making sure that the coated area is equal to the depth of the fitting socket. Section 20 - Landscaping 20.15 1/1/16 3.

c. Insert the pipe quickly into the fitting and turn the pipe approximately one-quarter (1/4) turn to distribute the solvent and remove air bubbles. Hold the joint for approximately fifteen (15) seconds so the fitting does not push off the pipe.

d. Use a clean rag and wipe off all excess solvent.

e. To prevent disturbing the last completed joint, the pipe must not be twisted when making subsequent joints.

f. Allow at least fifteen (15) minutes setup time for each welded joint before moving.

13. Threaded joints shall be wrapped with Teflon tape as per manufacturer's instructions.

14. Flush all debris out of pipe prior to installing valves and heads.

15. Install detectable marking tape 12" above main line pipe along the entire length of the main line run, including main line branches and irrigation crossover sleeves.

16. When utilizing existing main line, make connections to new main line using long-barrel self-restraint repair couplers.

G. Line Clearance

1. Irrigation lines shall have a minimum horizontal and vertical clearance of four (4) inches from each other. Parallel lines shall not be installed directly over one another.

2. Horizontal and vertical clearance of irrigation lines from lines from other trades shall be as per local codes and regulations.

3. Line clearances shall be inspected and approved by the District prior to backfilling trenches.

H. Joint Restraint System

1. Install Joint Restraint System as per details and manufacturer's specifications.

I. Gate Valves

1. Install as gate valves as per details and manufacturer's specifications.

2. Install where shown on Drawings. Locate, in valve boxes, twelve (12) inches from walk, curb, header board, etc., for easy access unless otherwise noted on drawings.

3. Install one gate valve per valve box. Provide extension units as required as per details. Install valve boxes in shrub planting areas whenever possible.

4. Install a T. Christy I.D. water quality tag on all gate valves. Attach the identification tags to the valve stem using a nylon cable tie.

5. It is the intent of the irrigation design to minimize valve boxes within the turf field area. When valve boxes are required to be installed in the soccer field, the contractor shall submit proposed locations to Landscape Architect to review and approve prior to installation

J. Quick Coupler Valve

1. Install as quick coupler valve as per details and manufacturer's specifications.

2. Install where shown on Drawings. Locate, in valve boxes, twelve (12) inches from walk, curb, header board, etc., for easy access unless otherwise noted on drawings.

3. Install one quick coupler valve per valve box. Provide extension units as required as per details. Install valve boxes in shrub planting areas whenever possible.

4. Install a T. Christy I.D. water quality tag on all gate valves. Attach the identification tags to the valve stem using a nylon cable tie.

5. It is the intent of the irrigation design to minimize valve boxes within the turf field area. When valve boxes are required to be installed in the turf field, the contractor shall submit proposed locations to Landscape Architect to review and approve prior to installation

K. Electric Remote-Control Valves

1. Install with 2-wire decoder and pressure regulator as per details and manufacturer's specifications.

2. Install where shown on Drawings. Locate valve boxes twelve (12) inches from, and perpendicular to walk, curb, header board, etc., for easy access.

3. Install one (1) remote control valve per valve box as per detail. Provide extension units as required so as valve is protected by adjacent native soil.

4. Install valve boxes in shrub planting areas wherever possible.

5. Provide twenty-four (24) inch expansion loop at all electrical connections wrapped neatly along interior wall of valve boxes.

6. Install a T. Christy I.D. tags on all valves identifying the controller and station number of the valve and water quality. Attach the identification tags to the valve stem using a nylon cable tie.

7. It is the intent of the irrigation design to minimize valve boxes within the turf field area. When valve boxes are required to be installed in the turf field, the contractor shall submit proposed locations to Landscape Architect to review and approve prior to installation

L. Master Valve and Flow Sensor

1. Install shall be in accordance with the corresponding detail in the Standard Drawings.

    a. Install with a minimum upstream and downstream length of straight pipe per manufacturer's specifications

2. Install with 2-wire decoder and sensor decoder per details and manufacturer's specifications.

3. Install a T. Christy I.D. tags on all valves identifying the controller and station number of the valve and water quality. Attach the identification tags to the valve stem using a nylon cable tie.

4. Contractor shall be responsible to calibrate flow sensor per manufacturer's specifications.

    a. Run flow test on each completed irrigation remote control valve to identify actual field flow using the controller learned flow system capabilities. Contractor shall work with manufacturer's representative as needed to perform accurate flow test.

    b. Contractor shall use field flow test results to schedule flow zones on controller system as part of schedule programing.

M. Automatic Controller

1. Install as per manufacturer's specifications, drawings and details.

2. Controller shall be securely mounted in the location as indicated on the Drawings or approved by the District in such a manner that all normal operations can be conveniently made by the operator.

3. The Contractor shall properly ground the controllers per contract documents and in accordance with N.E.C and local codes and as per manufacturer's specifications.

4. The Contractor shall take all decoder cables to the controller and make all required connections for their installation.

5. Contractor shall be responsible to program controller per contract documents. Run flow test for each control valve and use to program flow zones. Schedule remote control valves to maximize system pump efficiency and minimize system run times.

    a. The irrigation schedule provided per contract documents shall be used as a guide only. It is the Contractor's responsibility to adjust controller watering schedules based on actual site conditions including but not limited to plant species, soil conditions, slope, weather, irrigation application method, etc.

    b. At no time shall the contractor allow the pooling or runoff of water on the site due to length of irrigation cycle. Adjust run and soak times as needed to avoid pooling of water and runoff.

N. 2-Wire Decoder Cable

1. Install 2-wire decoder cable in conduit. Route along supply line piping wherever practical.

2. No cable splices shall be allowed between controller and valves and between valve to valve that are less than 500 feet apart.

3. Use one waterproof splice pack per splice. Indicate all splices on the "As-built" plan. Cable splice connections shall be per manufacture specifications.

4. Where control wires pass under paving, they shall pass through a Schedule 40 PVC sleeve.

5. Ground decoder 2-wire cable per manufacturer's specifications.

6. Install twenty-four (24) inch service loop neatly coiled inside the perimeter of the valve box to allow for valve, decoders and splices to be pulled to surface for servicing. Coil service loop neatly along inside wall of valve box.

O. Conduit

1. PVC Schedule 40 conduit with 2-wire decoder cable shall be installed as shown on plans and adjacent to irrigation mainline wherever possible.

2. The ends of the conduits, whether shop or field cut, shall be reamed to removed burrs and rough edges. Cuts shall be made square and true.

3. Install conduit couplers onto pipe ends when in direct contact with 2-wire decoder cable.

4. The ends of the conduit shall be capped until the pulling of wiring is started. Conduit shall be free of soil and debris.

5. Conduit bends, except factory bends, shall have a radius of not less than six times the inside diameter of the conduit.

6. Install a one-quarter (1/4) inch polypropylene pull tape in conduit. Loop pull tape into each valve box and splice box.

7. When utilizing existing conduit, the contractor will remove existing control wire, vacuum debris from conduit prior to installing new 2-wire cable through existing conduit. Install electric boxes as shown and as needed to facilitate installing new 2-wire cable in existing conduit.

P. Controller Earth Ground

1. Install earth grounding in accordance to Article 250 of the National Electrical Code and as per manufacturer's specifications.

2. Ground rods shall be driven a minimum of ten (10) feet into the ground in a vertical or oblique position. The angle of the rod relative to the vertical shall be no more than 45-degree angle.

3. Ground plates shall be installed in a horizontal position a minimum of 30" below ground level.

4. Grounding conductors shall be installed to avoid sharp bends. When bends are required to pass through buildings and equipment, they must have a minimum angle of 90° and a minimum radius of 8", which equates to a standard 1-1/2" PVC sweep conduit elbow.

5. Ground rods shall be installed in soils with minimum moisture content of 15% within the sphere of influence. Use supplemental irrigation as needed to meet this requirement.

6. Use "Earth Contact Materials" as needed and as per manufacturer's specifications to obtain desired soil resistivity.

7. Use permanent welded connections to connect grounding conductors to ground rods. Solder shall not be used for this connection.

8. The grounding grid shall be field tested to verify that resistance readings are no more than 10 ohms.

Q. 2-Wire Decoder Earth Ground

1. Install 2-wire decoder system earth grounding in accordance manufacturer's specifications.

R. Valve Boxes

1. Valve boxes installed in decomposed granite areas shall be tan colored; valve boxes installed in planter areas shall be green colored.

2. Install valve boxes in shrub planter areas wherever possible.

3. Install valve boxes in groupings as shown to facilitate long-term maintenance. Contractor to stake out dimensions of each valve box bank location for review and approval by Landscape Architect prior to installation.

4. Install valve boxes as per details unless otherwise noted on plans.

5. It is the intent of the irrigation design to minimize valve boxes within the soccer field area. When valve boxes are required to be installed in the soccer field, the contractor shall submit proposed locations to Landscape Architect to review and approve prior to installation

S. Electric Pull Boxes

1. Pull boxes must be installed at the following locations:

   a. At all 2wire decoder cable splices, except splices made in valve boxes.

   b. At every 5th bend or at intervals not to exceed one hundred and fifty (150) feet (150') along any 2wire decoder cable path, whichever comes first.

   c. Within five feet (5') of irrigation controllers or within five feet (5') of cabinets housing one (1) or more controllers.

   d. At conduit stub outs.

   e. At the ends of conduit crossover sleeves. Include eighteen-inch (18") of 2wire decoder cable loop along inside of pull box.

   f. At other locations shown on the Plans.

   g. The tops of all pull boxes must be flush with the surrounding finished grade.

h. When utilizing existing conduit to install new 2-wire decoder cable, Contractor shall be responsible to install electric pull boxes as needed to facilitate installation.

i. It is the intent of the irrigation design to minimize electric boxes within the turf field area. When electric boxes are required to be installed in the turf field, the contractor shall submit proposed locations to Landscape Architect to review and approve prior to installation.

2. When approved by the District, the Contractor may install additional pull boxes to facilitate the work. Additional pull boxes installed for the contractor's convenience will be at the Contractor's expense.

T. Irrigation Heads

1. Install irrigation heads as detailed on the Drawings. Irrigation heads to be installed in this work shall be as per approved submittals.

2. Irrigation heads shall be installed plumb and vertical to finish grade unless otherwise noted on plan.

3. Replace all clogged nozzles with new nozzles.

4. Adjust rotor, rotator arcs and radii as needed to prevent overspray onto hardscapes, walkways, buildings, etc.

5. Spacing of heads shall not exceed the maximum indicated on the Drawings. In no case shall the spacing exceed the maximum recommended by the manufacturer. Adjust radii to obtain head to head coverage as per manufacturer's specifications

6. Swing joints shall be in accordance with the details and approved submittals.

7. Swing joints for heads shall be the same size as the inlet opening of the sprinkler body.

8. Add additional heads as needed to provide head to head coverage with no additional cost to the District.

U. Irrigation Head Replacement – Turf Field

1. The contractor shall remove existing irrigation heads, clean and return to District per drawing notes.

2. Cap existing swing joint risers to prevent dirt and debris from entering irrigation system piping.

3. Flag or mark by approved methods location of irrigation head to be replaced.

4. After finished grade is established in soccer fields, install new rotors per contract documents.

5. Flush irrigation lines clear of dirt and debris prior to installing nozzles.

6. Install nozzles and adjust radii and arc as per plan.
7. Contractor shall be responsible to make final head layout adjustments as needed based on actual field conditions at no additional cost to District.

3.05 SYSTEM ADJUSTMENT

A. The Contractor shall flush and adjust all irrigation heads for optimum performance and to prevent over-spray onto walks, windows, roadways, and buildings as much as possible.

B. If it is determined that adjustments in the irrigation equipment shall provide proper and more adequate coverage, the Contractor shall make such adjustments after written approval by the District. Adjustments shall include changes in head locations, nozzle size and degrees of arc as required without additional contract costs.

C. If it is determined that any irrigation equipment is improperly installed, the contractor shall reinstall the equipment to conform to construction documents.

D. All irrigation heads shall be set perpendicular to finished grades unless otherwise designated on the Drawings.

3.06 TESTING OF THE IRRIGATION SYSTEM

The Contractor shall request the presence of the District at least two (2) working days in advance of testing or as noted below.

A. Existing Main Line Pressure Test in Turf Fields - BASELINE

1. Contractor shall perform baseline pressure test on existing main line in soccer field to be retained and protected prior to start of work.

1.) Contractor shall provide a proposed method to perform pressure test based on requirements listed here within to Landscape Architect for approval prior to start of work.

2.) Contractor shall comply to contract document requirements for Main Line Pressure Test.

B. Main Line Pressure Test

1. Except for non-rigid pipelines and lateral irrigation lines, pressure testing for leakage must be performed on all supply lines installed by the Contractor.

2. Pipelines must be tested in place and all open ends of the pipeline and fittings must be plugged or capped prior to testing.

3. The Contractor must notify the District at least twenty-four (24) hours prior to performing any pressure test. Pressure test must be performed only between the hours of 8:00 a.m. and 5:00 p.m. except that no pressure tests shall be made on Saturdays, Sundays, or legal holidays unless otherwise approved in writing by the District.

4. Test all pressure lines and connections to remote control valves and gate valves under hydrostatic pressure of one hundred and twenty (120) pounds per square inch.

5. Pipelines to be tested must be filled with water, and a pressure gauge must be connected to the pipeline. The pipe must then be placed under a pressure of one hundred twenty (120) pounds per square inch, after which the source of pressure must be cut off, leaving the line under the required pressure.

6. The pressure gauge must be calibrated from zero (0) to two hundred (200) pounds per square inch (psi) in five (5) pound increments and must be accurate within a tolerance of two (2) pounds.

7. The Contractor must provide the necessary pump and equipment required for this test.

8. The pipeline must be tested under the required pressure for a period of two (2) hours. The pressure gauge must remain in place until each test period has been completed.

    a. Leaks that develop in the tested portion of the system must be located and repaired after each test period when a drop of more than two (2) pounds is indicated by the pressure gauge when testing pipe over one hundred feet (100') in length. There must be no pressure drop permitted when testing pipe from one (1) foot to one hundred feet (100') in length.

    b. After such leaks have been repaired, the two (2) hour pressure test must be repeated and additional repairs made until pressure test passes.

9. If testing by means of water pressure, air must be expelled from the pipe prior to testing.

10. Tests on pressure lines must be completed prior to backfilling; however, sufficient backfill must be placed in trenches between fittings to insure the stability of the line under pressure.

    a. In all cases, fittings and couplings must be open to visual inspection for the full period of the test. No testing shall be done until the last solvent welded joint has had twenty-four (24) hours to cure.

11. All hydrostatic tests shall be made only in the presence of the District. No pipe shall be backfilled, except for center loading, until it has been observed, tested and approved in writing by the District.

    a. Should any work be covered up before such observation and tests are completed, the Contractor shall, at his own expense, uncover the work; and after it has been observed, tested and approved, he then shall make all repairs with such materials as required to restore all work disturbed to original and proper condition.

12. Contractor must disinfect potable water lines according to AWWA standards.

C. Repairs and Coverage

1. All leaks that develop and all defective material in any portion of the irrigation system installed by the Contractor must be repaired or replaced by the Contractor.

2. The entire system must be checked and, if necessary, adjusted for uniform and complete coverage after installing the sprinklers.

3. The risers for sprinklers on slopes must be set approximately perpendicular to the slope. Each series of sprinklers must be installed, and test operated. Nozzles of all sprinklers and bubblers must be adjusted for proper rate of flow and coverage. Sprinklers and/or bubblers must be relocated as required to produce uniform coverage.

4. A coverage test shall be performed after the irrigation system is completed, an irrigation water audit has been performed and recommended adjustments to the irrigation system have been made.

5. Furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from the Drawings or where the system has been willfully installed as indicated on the Drawings, when it is obviously inadequate without bringing this to the attention of the District.

6. The sprinkler coverage test shall be completed and approved before landscape material is planted.

3.07 TEMPORARY REPAIRS

A. The District reserves the right to make temporary repairs as necessary to keep the irrigation system in operating condition. The exercise of this right shall not relieve the Contractor of his responsibilities under the terms of the guarantee as herein specified.

3.08 IRRIGATION WATER AUDIT

A. The Contractor shall conduct an Irrigation Water Audit using a Certified Irrigation Auditor after the final field observation has been completed and all irrigation components are installed in accordance with the plans and specifications and the irrigation system is accepted by the District.
B. The Irrigation Water Audit shall be conducted in accordance with the latest California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance.

C. Contractor shall incorporate Irrigation Water Audit results while programing Irrigation Controller for specific control zones including but not limited calculations for Zone Flow, Precipitation Rates, Irrigation Efficiency and Distribution Uniformity.

D. The Irrigation Water Audit shall be included in a binder complete with:
    1. Cover Sheet with Location, Date, Owner and Certified Irrigation Auditor contact information.
    2. Irrigation System Evaluation Checklist
    3. Sprinkler Evaluation Data Sheet for each zone
    4. Other information as required by latest California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance.

E. Contractor shall be responsible to make recommended adjustments to the irrigation system based on Irrigation Water Audit Report, at no additional cost to owner when adjustments required are due to the Contractors installation inaccuracies of irrigation head placement.

F. Submit Irrigation Water Audit with Close Out Documents.

3.09 MAINTENANCE

Provide maintenance as per SECTION 02970 - **LANDSCAPE MAINTENANCE.**

3.10 CLEAN-UP

Clean up shall be made as each portion of work progresses. Refuse and excess dirt shall be removed from site. All walks and paving shall be broomed or washed down, and any damage sustained to the work of others shall be repaired to original conditions acceptable to the District.

3.11 OBSERVATION PRIOR TO FINAL ACCEPTANCE

A. The Contractor shall operate each system in its entirety for the District at time of final observation. Any items deemed not acceptable shall be reworked to the complete satisfaction of the District.

B. The Contractor shall show evidence to the District that the District has received all accessories, charts, Record Drawings and equipment as required before final observation can occur.

3.12 INSPECTION SCHEDULE

A. The Contractor shall be responsible for notifying the Landscape Architect in advance for the following observations according to the time indicated:

1. Staking points of connection, power connections to controllers, location of irrigation main lines, remote control valves– two (2) working days

2. Staking of laterals and irrigation heads - two (2) working days

3. Sprinkler head coverage test and finish grade review prior to planting - two (2) working days

B. No site visits shall commence without all items noted in previous Observation Reports, either completed or remedied, unless such compliance has been waived. Failure to accomplish punch list tasks or prepare adequately for desired observations shall make the Contractor responsible for reimbursing the Landscape Architect at his current billing rates per hour, plus transportation costs.

C. Normal progress observations shall be requested by the Contractor from the Landscape Architect as per observations listed in specifications SECTION 02905 - **LANDSCAPE INSTALLATION**.

D. No final observation shall commence without Record Drawings. In the event the Contractor calls for an observation without Record Drawings, without completing previously noted corrections or without preparing the system for observations, he shall be responsible for reimbursing the District at the hourly rate in effect at the time of the observation (plus transportation costs) for the inconvenience. No further observations will be scheduled until this charge has been paid.

3.13 FINAL TEST

A final test of the irrigation system shall be made in the presence of the Landscape Architect at the end of the landscape maintenance period. The system will be accepted only when the entire system performs as set forth on the drawings and specifications and all contract documentation has been received and approved.

A. CLOSE OUT DOCUMENTS

G. Record Drawings; The Contractor must maintain neat and accurate record drawings in conformance with these specifications.

1. Drawings shall be subject to the inspection of the District at all times and must be kept current with all work instructions, change orders, substitutions, and construction adjustments shown thereon and initialed by the inspector.

2. Immediately following the start of the Plant Establishment Period, the Contractor must submit to the District one (1) full size set of Record Drawings.

a. Record drawings will be reviewed by the Landscape Architect and shall be returned to the Contractor with comments for revisions, if necessary.

b. Notes and dimensions must be drafted on the record drawings in a neat and legible manner. Drawings must be of sufficient quality to allow further black and white reproduction of the original to be clear.

c. Illegible, inaccurate, or incomplete record drawings will be returned to the Contractor for revisions.

3. The work will not be formally accepted until the Record Drawings are approved by the Landscape Architect. Upon approval by the Landscape Architect, two (2) bond sets of record drawings must be delivered to the District in good and acceptable condition prior to final acceptance of the Work.

H. Controller Charts: The Contractor must provide two (2) sets of 11" x 17" charts for each controller. One copy must be placed on the inside of the controller enclosure door. The second copy must be provided to District maintenance personnel.

1. The base plan for the controller charts must be the approved irrigation Record Drawings.

2. Each controller chart must show the as-built condition of the area controlled by the automatic controller.

3. All symbols must be readable at the final reduced size.

4. The controller chart must include:

a. Connections to existing water lines (point-of-connections).

b. Location of backflow preventer(s) and controller(s)

c. Routing of pressure lines and sleeves (show typical station offset and/or dimensions on record drawings)

d. Routing of irrigation conduit and pull boxes

e. Locations of remote control valves, gate valves, and quick coupling valves (show station offset and/or dimensions on record drawings)

f. Other items as directed by the District.

5. The chart must be color-coded to easily identify each valve and the respective hydrozone area it irrigates.

6. When completed and approved, the chart must be hermetically sealed between two (2) pieces of 10 mil plastic, minimum.

7. Each chart must be completed and approved prior to final inspection of the irrigation system.

I. Operation and Maintenance Manual: The Contractor must provide two (2) binders complete with the following information for all irrigation components installed on project:

1. Operating instructions

2. Parts list and breakdown diagram

3. Complete copy of "Approved" irrigation submittals

4. Controller charts and irrigation scheduled for plan establishment and mature water requirements.

5. Irrigation audit report.

6. Acceptance letter that Owner has received "Equipment to be Furnished" and "Training" from contractor as per contract documents.

7. Certificate of Completion

8. Written guarantee and certificate of insurance from the Contractor.

D. Equipment to be Furnished: The Contractor must deliver all tools and equipment called for on the plans and described herein to the District.

1. Two (2) key sets for locking irrigation controller.

2. Two (2) valves of each size and type used.

3. Two (2) decoders of each type used.

4. Five (5) rotors of each type used.

5. Five (5) pop up sprinklers of each type used.

6. Five (5) complete nozzle sets of each type used.

7. Five (5) bubblers of each type used.

8. One Hundred (100) feet of drip tubing for each type used.

9. Ten (10) drip emitters for each type used

10. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler used.

11. Two (2) sets of special tools required for removing, disassembling and adjusting each type of joint restraint used.

12. Two (2) lock and key sets for controller enclosures (keyed as per District specifications)

13. Two (2) quick coupler keys and matching hose swivels

14. Two (2) 60" isolation valve opening keys

15. Four (4) security keys for locking valve boxes

16. Two (2) hand-held remote-controls transmitters and cases

17. Two (2) hand-held 2-wire decoder programmers

E. System Walkthrough and Training with District: After the system has been installed and approved and close out documents have been received by the District, the Contractor shall schedule an onsite system walkthrough and training with the District. The system walkthrough will be no less than 2 hours and shall cover the following:

   a. Operation of controller system including programing of features and alert systems.
   b. Operation of hand held remote for remote operation of field valves include testing of field valves.
   c. Operation of field decoder programmer including programing sample decoder.
   d. Calibration of flow sensor and running flow test.
   e. Maintenance requirements for valves, sprinklers and nozzles.

END OF SECTION

SECTION 02905

LANDSCAPE INSTALLATION

PART I - GENERAL

1.01 CONDITIONS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements (if any) apply to the work specified in this Section.

1.02 SCOPE OF WORK

A. Furnish all labor, material, equipment and services necessary to provide all landscape work, complete in place, as indicated on Drawings and specified herein.

Work specified in this Section, but is not limited to the following:

1. Soil preparation
2. Decomposed Granite Paving
3. Planting
4. Fertilizer
5. Tree Staking
6. Sodding
7. Clean-up

B. Related Work Specified in Other Sections

1. SECTION 02260 - **LANDSCAPE GRADING**
2. SECTION 02811 - **IRRIGATION SYSTEM**
3. SECTION 02970 - **LANDSCAPE MAINTENANCE**

1.03 QUALITY ASSURANCE

A. Source Quality Control

1. Submit documentation to the Owner at least sixty (60) days prior to start of planting that all plant material has been ordered. Arrange procedure for observation of plant material with the Owner at time of submission.

2. Plants shall be subject to observation and approval of the Owner upon delivery for conformity to specifications. Such approval shall not impair the right of observation and rejection during progress of the work.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery

1. The Contractor, upon request by the Owner, shall provide receipts, delivery tickets, load tickets, etc. of all items delivered to the job site to verify products and total quantities.

2. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name trademark, and conformance to State Law.

3. Deliver plants with legible identification labels.

   a. Label trees, evergreens, bundles of containers of like shrubs, or ground cover plants.
   b. State correct plant name and size indicated on plant list.
   c. Use durable waterproof labels with water-resistant ink which will remain legible for at least sixty (60) days.

6. Protect plant material during delivery to prevent damage to root ball or desiccation of leaves.

7. The Contractor shall notify the Owner forty-eight (48) hours in advance of delivery of all plant materials for observation either at the site or at the local nursery.

B. Storage

1. Store plant material in shade and protect from weather.

2. Maintain and protect plant material. Contractor shall be responsible for replacement of material due to theft or vandalism.

C. Handling

1. Do not drop plant materials.

2. Do not pick up container plant material by stems or trunks.

1.05 JOB CONDITIONS

A. Planting: Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

B. Scheduling: Install trees, shrubs, and ground cover plant material before lawn areas are installed and after irrigation system is operable.

C. Protect work and materials from damage due to construction operations by other contractors and trades and by vandalism. Maintain protection during installation.

1.06 SAMPLES AND TESTS

A. The Owner reserves the right to take and analyze samples of materials for conformity to specifications at any time. The Contractor shall furnish samples upon request by Owner. Rejected materials shall be immediately removed from the site at Contractor's expense. Cost of testing of materials not meeting specifications shall be paid by the Contractor.

B. Existing soils report provided at end of section 02905.

C. Provide horticultural soils report of existing landscape soil after rough grade and submitted topsoil including information on soil texture, filtration rate, nutrient levels and organic matter. Include recommendation for amendment to be added to existing landscape soil and topsoil to mitigate any deficiencies.

1.07 GUARANTEE AND REPLACEMENT

A. Guarantee: All plant material and other materials installed under the Contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship for a period of one (1) year. Any plant found to be dead or not in a satisfactory or healthy condition due to faulty materials, workmanship, or improper maintenance as determined by the, shall be replaced by the Contractor at his expense.

B. Replacement: Any materials found to be dead, missing or not in a satisfactory or healthy condition during the Contract period shall be replaced immediately. The Owner shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within fifteen (15) days of written notification by the Owner. All replacement materials and installation shall comply with the Drawings and Specifications.

PART 2 - PRODUCTS

2.01 GENERAL

All materials shall be of standard, approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged

material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. The Contractor shall supply the Owner with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance of bearing the manufacturer's guaranteed analysis.

2.02 PRODUCTS

A. Soil Conditioner

1. Gro-Power Plus: Humus (bacteria included based fertilizer and soil conditioner with soil penetrant shall consist of the following percents by weight:

    5 % nitrogen
    3 % phosphoric acid
    1 % potash
    50 % humus
    15 % humic acids

B. Soil Amendment

1. Nitrogen Stabilized Shavings: 0.56 to 0.84% N based on dry weight for fir bark mulch, treated with relative form of nitrogen (NH3).

    a. Particle Size: 95% - 100% passing 6.35 mm standard sieve.
    80% - 100% passing 2.33 mm standard sieve.
    b. Salinity: The saturation extract conductivity shall not exceed 3.5 mil/centimeter at 25 degrees (25°) centigrade as determined by saturation extract method.
    c. Iron Content: Minimum 0.08% dilute acid soluble Fe on dry weight basis.
    d. Ash: 0 - 6.0% (dry weight)

C. Fertilizer

1. Fertilizer: Shall be Gro-Power Plus (bacteria included) with soil penetrant and shall consist of the following percents by weight:

    5% nitrogen
    3% phosphoric acid
    1% potash
    50% humus
    15% humic acid

2. Fertilizer: Shall consist of the following percents by weight:

    6% nitrogen
    20% phosphoric acid
    20% potash

3. Ammonia Sulfate: Shall consist of the following percents by weight:

   21% nitrogen
   0% phosphoric acid
   0% potash

4. Turf Starter Fertilizer: Shall consist of the following percents by weight:

   16% nitrogen
   6% phosphoric acid
   8% potash

5. Planting Tablets: Slow-release 21 gram tablets as manufactured by Agriform or approved equal, containing the following percent-ages of nutrients by weight:

   20 % nitrogen
   10 % phosphoric acid
   5 % potash

6. Inoculum: Shall be Grow-Life Mycorrhizal Inoculum / Soil Conditioner

D. Imported Soil

1. Imported soil shall be obtained from a source approved by the Landscape Architect.

2. Imported topsoil shall be of friable sandy-loam texture free of refuse, roots, heavy or stiff clay, rocks, sticks, brush or other deleterious materials. Topsoil acidity range (pH) shall be between 6.5 to 7.5 containing a minimum of 4% and a maximum of 25% organic matter. Topsoil shall be free of all noxious weeds. Topsoil samples and analysis shall be submitted to the Landscape Architect for approval prior to delivery of any soil to the project site. Should the Landscape Architect reject any portion of the delivered soil, for any reason, it shall be removed immediately at no cost to the Owner.

3. Topsoil, if rejected, shall be amended to meet specifications. Submit amended topsoil analysis to Landscape Architect for verification.

4. See also Landscape Grading Section 02260.

E. Plant Material

1. The plant material indicated on the Drawings by the listed names shall conform to "Standardized Plant Names", second edition, except for names not covered there in, the established customs of the nursery trade is followed. All plants shall be true to name, above one of each bundle or lot shall be tagged with the name and

size of the plant, in accordance with the standards of practice recommended by the American Association of Nurserymen. All plant materials shall meet the specifications of Federal, State and County laws, requiring observation for plant diseases and insect infestations. Plants shall be symmetrical, typical for variety and species, sound, healthy, vigorous, free from plant diseases, insect pests or other eggs, and shall have healthy, normal root systems, while filling their containers, but not to the point of being root bound. Use only plant materials that are first class representative of the species and cultivars specifies and that conform to all State and local laws governing the sale, transportation, and observation of plant materials. Plants shall have straight, single trunks, unless otherwise specified on the plans. Those specified to be multi-trunk shall have at least three (3) main leaders from the base. Any and all plants that have any encircling roots (not root bound) shall have root balls lightly slashed on a minimum of three (3) sides to stop encircling root growth. The height and spread of all plant materials shall be measured with branches in their normal position. Sizes of plants shall be as stated on the plant list, five and fifteen (5 & 15) gallon can container stock shall have been grown in that container not less than six (6) months, but shall not have been overgrown in the containers so as to have become root bound.

2. The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified in the Special Conditions or Drawings. The minimum acceptable size of all plants, measured before pruning with the branches in normal position, shall conform with the measurements, if any, specified on the Drawings in the list of plants to be furnished. Plants larger in size than specified may be used with the approval of the Owner, but if the use of larger plants is approved, the ball of earth or spread of roots for each plant will be increased proportionally. Plant material shall conform to the following Specifications for container stock:

SHRUBS

SIZE	TYPE	EXAMPLE	HEIGHT	SPREAD	CALIPER
1 Gal.	low growing	Pitt. tobira - etc.	8-10"	6-8"	
1 Gal.	tall growing	Pitt. eugen. - etc.	10-12"	6-8"	
5 Gal.	low growing	Pitt. tobira - etc.	15-18"	15-18"	
5 Gal.	tall growing	Pitt. eugen. - etc,	24-30"	15-18"	
15 Gal.	low growing	Pitt. tobira - etc.	30-36"	30-36"	
15 Gal.	tall growing	Pitt eugen. - etc.	42-48"	36-42"	

TREES

5 Gal.	slow growing	Quercus - etc.	5-6'	12-18"	1/4 - 1/2"
5 Gal.	fast growing	Euc. - Prunus - etc.	6-7'	12-18"	1/2 - 3/4"
15 Gal.	slow growing	Quercus - Pyrus - etc.	7-8'	24-30"	3/4 - 1"
15 Gal.	fast growing	Euc. - Prunus - etc.	8-10'	30-36"	1- 1 1/4"
24" Box	slow growing	Quercus - Pyrus - etc.	8-10'	3-4'	1 1/2-1 3/4"
24" Box	fast growing	Euc. - Prunus - etc.	10-12'	4-5'	1 3/4-2 1/2
30" Box	slow growing	Quercus - Pyrus - etc.	12-14'	6-7'	2 1/2 - 3"
30" Box	fast growing	Euc. - Prunus - etc.	12-14'	6-7'	2 1/2 - 3"
36" Box	slow growing	Quercus - Pyrus - etc.	14-16'	8-10'	2 1/2 - 3"
36" Box	fast growing	Euc. - Prunus - etc.	14-16'	8-10'	2 1/2 - 3"
36" Box	fast growing	Euc.- Prunus - etc.	14-16'	8-10'	2 1/2 - 3"

3. All plants not conforming to the requirements herein specified, shall be considered defective and such plants, whether in place or not, shall be marked as rejected and immediately removed from the site of the work and replaced with new plants at the Contractor's expense. The plants shall be of the species, variety, size, and condition specified herein or as shown on the Drawings. Under no conditions will there be any substitution of plants or sizes listed on the plans, except with the expressed written approval of the Owner.

4. At no time shall trees or plant materials be pruned, trimmed or topped prior to delivery and any alteration of their shape shall be conducted only with the approval and when in the presence of the Owner and/or as noted on the Planting Specifications.

5. Nursery Grown and Collected Stock

    a. Plant materials shall conform with the best edition of ANSI Z60.1-1990 American Standard for Nursery Stock.
    b. Grown under climatic conditions similar to those in locality of project.
    c. Container-grown stock in vigorous, healthy condition, not root bound or with root system hardened off.
    d. Use only linear stock plant material which is well established in removable containers or formed homogeneous soil sections.

6. Ground Cover: Ground cover plants shall be grown in flats, peat pots, or taken as cuttings, as indicated on the plans. Flat grown plants (rooted cuttings) shall remain in those flats until transplanting. The flat's soil shall contain sufficient moisture so that it will not fall apart when lifting the plants. If plants from peat pots are used, the pots shall be protected at all times prior to planting to prevent unnecessary drying of the rootball.

F. Tree Staking Material

1. Stakes for Tree Support

    a. Wood Tree Stakes: Lodge pole pine stakes full-length treated with copper naphthanate. Minimum nominal size: two inches in diameter x eight feet (2"x 8') long and pointed at one (1) end (adjust length to fit tree). Stakes shall be free from knots, checks, splits, or disfigurements.

2. Ties

    a. 24" length cinch tie as manufactured by V.I.T. Company 1-714-871-2309 or approved equal.

3. Duckbill Total System tree anchor kit with white vinyl coated cable by Foresight Products, Inc., 1-800-325-5360.

    a. Safety sleeve one-half (1/2) inch black polyethylene tubing.

G. Mulch

1. Mulch shall be walk-on fir bark mulch as manufactured by Lassen Forest Products, Red Bluff CA., 1-800-621-8557 or approved equal.

2. The mulch shall consist of fir bark mulch with a particle range of three-quarter to one and one-half (3/4 -1 1/2) inch in diameter. Shredded redwood bark ("gorilla hair") is not acceptable.

H. Sod

1. Sod varieties shall be as specified on Drawings. Sod shall be healthy, weed free, and obtained from a certified sod growing nursery or farm.

2. All sod shall be cut within twenty-four (24) hours prior to installation.

L. Fungicide

1. "Subdue" (Cibiba-Geigy) or approved equal.

2. Sod Planting – Fungicide labeled for fungi known to effect turf grass in Northern Central Valley or Northern California.

M. Pre-emergent

1. Pre-emergent, as approved by the Landscape Architect - prevent annual weed development in hydromulch applications. Do not use in hydromulch mixes incorporating annual wildflower or grass seeds.

N. Weed Control

1. Use Enide (Upjohn), Dymid (Elanco Products Co.), Treflan, Eptan, Surflan or approved equal.

O. Root Barrier

1. By Deep Root Corp. model numbers UB-18-2 or approved equal.

P. Miscellaneous Materials

1. Sand: wash river sand or equal.

2. Tree wound paint: as approved. Morrison Tree Seal, Cabot Tree Paint, or approved equal.

PART 3 - EXECUTION

3.01 OBSERVATION

The Owner's Representative to verify that topsoil has been imported, and final grades have been established prior to beginning planting operations. The Owner to observe, shrubs and liner stock plant material for injury, insect infestation and trees and shrubs for improper pruning. Do not begin planting of trees until deficiencies are corrected or plants replaced.

3.02 LAYOUT OF PLANTING AREAS

A. Stake or mark with lime locations for plants and outline of planting beds on ground. Do not begin excavation until plant locations and plant beds are acceptable to the Landscape Architect. The irrigation system shall be operational and approved prior to planting.

B. Locations for plants and outlines of areas to be planted shall be marked on the ground by the Contractor before any plant pits are dug. All such locations shall be approved by the Landscape Architect. If an underground construction or utility line is discovered prior to work, other locations for planting may be selected by the Landscape Architect.

3.03 INSTALLATION

A. Preparation of planting areas areas:

1. Amend soil per recommendations of soil analysis outlined in Section 02905 Paragraph 3.07.

2. All soil areas shall be compacted and settled by application of heavy irrigation to a minimum depth of twelve (12) inches.

3. After grading and de-rocking, and prior to planting, add 3" of imported soil in turf areas, and incorporate amendments in Section 02905 Paragraph 2.02. to a depth of four (4) inches.

4. At time of planting, the top six (6) inches of all areas to be planted shall be free of stones, stumps, or other deleterious matter one (1) inch in diameter or larger, and shall be free from all wire plaster, or similar objects that would be a hindrance to planting and maintenance. All rock larger than 1 inch to be removed by mechanical means, either by sieve for loose rock and by heavy equipment if solid bedrock.

B. Final Grades

1. Finished grading shall insure proper drainage of the site. Conform to specification SECTION 02260 - **LANDSCAPE GRADING.**

2. The following areas shall be graded so that the final grades shall be established below adjacent paved areas, sidewalks, valve boxes, clean outs, area drains, curbs, etc. as follows:

   a. Shrub/ground cover areas: 2-1/2 inches
   b. Sod areas: 1-1/2 inches

3. Surface drainage shall be away from all building foundations, where applicable.

4. Dispose of excess or unacceptable soil from the site.

3.04 PLANT INSTALLATION

A. General

1. Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, as approved by the Owner.

2. Only as many plants as can be planted and watered on that same day shall be distributed in a planting area.

3. Container shall be opened and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.

B. Layout of Major Plantings

1. Locations for plants and outlines of areas to be planted shall be marked on the ground by the Contractor before any plant pits are dug. All such locations shall be approved by the Owner. If an underground construction or utility line is discovered prior to work, other locations for planting may be selected by the Owner.

C. Planting of Trees and Shrubs

1. Excavation for planting shall include the stripping and stocking of all acceptable topsoil encountered within the areas to be excavated for trenches, tree holes, plant pits and planting beds.

2. Excess soil generated from the planting holes and not used as backfill or in establishing the final grades shall be removed from the site.

3. Excavating for Planting:

a. Shape

i. Vertical sides and flat bottom.
ii. Plant pits to be square for box material, circular for canned material.
iii. Scarify sides and bottom of each pit.

b. Size: All trees and shrubs shall have planting pits dug twice the diameter of the root ball. Backfill around the root ball with prepared backfill mix.

4. Protect all areas from excessive compaction when trucking plants or other materials to planting site.

5. Install Root Barrier at all locations where tree is with 5'-0" of concrete or other hardscape.

6. Can Removal

a. Cut cans on two (2) sides with an acceptable can cutter.

b. Do not injure the root ball.

c. Do not cut cans with spade or ax.

d. Carefully remove plants without injury or damage to root ball.

e. After removing plant, manually scarify root ball to loosen perimeter roots.

7. Box Removal

a. Remove bottom of plant boxes before planting.

b. Remove sides of box without damage to root ball after positioning plant and partially backfilling.

8. Center plant in pit.

9. Face plants with fullest growth into prevailing wind.

10. Set plant plumb and hold rigidly in position until soil has been tamped firmly around ball roots.

11. Remainder of planting pit shall be backfilled with:

a. Amended soil per Soil Analysis and Drawing Detail.
b. Grow Power-Plus per rate of manufacture's recommendations.
c. Specified type and quantity of planting tablets

12. All plants which settle shall be raised to the correct level. After the plant has been placed, additional backfill shall be added to the hole to cover approximately one-half (1/2) of the height of the root ball. Water shall be added to the top of the partly filled hole to thoroughly saturate the root ball and adjacent soil.

13. After the water has completely drained, planting tablets shall be placed adjacent to but not in contact with root ball:

    One (1) tablet per 1-gallon container
    Two (2) tablets per 5-gallon container
    Three (3) tablets per 15-gallon container
    Four (4) tablets per 24" box
    Five (5) tablets per 30" box
    Six (6) tablets per 36" box
    Seven (7) tablets per 42" box
    Eight (8) tablets per 48" box and larger box sizes

14. The remainder of the hole shall be backfilled.

15. After backfilling an earthen basin shall be constructed around each plant. Each basin shall be of a depth sufficient to hold at least two (2) inches of water. Basin shall be of a size suitable for the individual plant. In no case shall the basin for fifteen (15) gallon plant be less than four (4) feet in diameter; a five (5) gallon plant less than three (3) feet in diameter. The basins shall be constructed of amended backfill materials and shall not be constructed for trees in turf areas. Edge of planter to be 2-1/2" below finish grade to allow for bark and prevent spilling onto sidewalk and existing parking lot.

16. Pruning: Pruning shall be limited to the minimum necessary to remove injured twigs and branches and to compensate for loss of roots during transplanting, but never to exceed one-third (1/3) of the branching structure. Upon approval of the Owner, pruning may be done before delivery of plant, but not before plants have been observed and approved. Cuts over three-quarter (3/4) inch in diameter shall be painted with tree wound paint.

17. Staking and Guying

    a. Staking of all trees shall conform to tree staking and tree guying details.

    b. Flagging: All guys are to be flagged 90% of the wire length and shall be covered with black polyethylene one-half (1/2) inch diameter tube.

    c. One (1) tree of each size shall be staked and approved by the Owner prior to continued staking.

D. Planting of Ground Cover

1. Ground cover shall be planted in straight rows and evenly spaced, unless otherwise noted, and at intervals called out in the Drawings. Triangular spacing shall be used unless otherwise noted on the Drawing.

2. Each rooted plant shall be planted with its proportionate amount of flat soil or in a peat pot in a manner that will insure minimum disturbance of the root system, but in no case shall this depth be less than two (2) nodes. To avoid drying out, planting shall be immediately irrigated after planting until the entire area is soaked to the full depth of each hole, unless otherwise noted on the Drawing.

3. Care shall be exercised at all times to protect the plants after planting. Any damage to plants by trampling or other operations of this Contract shall be repaired immediately.

E. Sod Planting

1. Soil Preparation: As per paragraph 3.03 A.

2. Grading and Rolling: Carefully smooth all surfaces to be sodded. Roll area to expose soil depressions or surface irregularities. Regrade as required.

3. Fertilizing: Spread turf fertilizer (16-6-8) onto the soil evenly at the rate of four (4) pounds per 1,000 square feet of lawn area.

4. Laying sod: Lay first strip of sod along a straight line (use a string in irregular areas). Butt joints tightly, but do not overlap edges. On second strip, stagger joints. Use a sharp knife to cut sod to fit curves, edges and irrigation heads.

5. Watering: Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.

6. Rolling sod: After laying all sod, roll lightly to eliminate irregularities and to form good contact between sod and soil. Avoid a very heavy roller or excessive initial watering which may cause roller marks.

7. Irrigation: Water thoroughly the completed lawn surface. Soil should be moistened at least eight (8) inches deep. Repeat irrigation at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

8. Replacement: Replace all dead or dying sod with equal material as directed by the Owner.

H. Weed Control

1. Apply weed control to all non-turf areas after completion of all planting and one (1) complete watering (to "set" plants).

2. Apply as per manufacturer's specifications.

I. Fungicide

1. Apply fungicide to all turf following installation

2. Apply as per manufacturer's specifications.

3. After initial application apply at two-week intervals as required to prevent fungus until end of Contract period.

J. Hardpan Conditions

1. Where hardpan exists, whether it is in the form of caliche or other impervious clay, and it is within the top two-and-one-half feet (2-1/2') of soil, use powered equipment to break through completely at each plant location to allow drainage and root growth. Remove hardpan at least one-and-one-half feet (1-1/2') greater than the rootball diameter of plant. Backfill with soil mix as specified.

2. Where hard pan is within the first twelve (12) inches of soil, it shall be completely penetrated for all trees and shrubs.

3.05 OBSERVATION SCHEDULE

A. The Contractor shall be responsible for notifying the Owner in advance for the following observations according to the time indicated:

1. Pre-construction conference - 7 days.

2. Rough grade review - 48 hours.

3. Controller and backflow preventer installation review - 48 hours.

4. Irrigation pressure line and lateral line installation and testing - 48 hours.

5. Irrigation sprinkler coverage test - 48 hours.

6. Finish grade review - 48 hours.

7. Plant material review - 48 hours.

8. Plant layout review - 48 hours.

9. Soil preparation, plant layout, and planting operations. One (1) tree with each type of specified shall be approved prior to planting of trees - 48 hours.

10. End of landscape installation - 48 hours.

11. Final Acceptance - 48 hours

B. No site visits shall commence without all items noted in previous Observation Reports either completed or remedied, unless such compliance has been waived. Failure to accomplish punch list tasks or prepare adequately for desired observations shall make the Contractor responsible for reimbursing the Owner at his current billing rates per hour, plus transportation costs.

3.06 CLEAN UP

After all planting operations have been completed; remove all trash, excess soil, empty plant containers or rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site. The Contractor shall pick-up all trash resulting from this work no less frequently than each Friday before leaving the site, once a week, and/or the last working day of each week. All trash shall be removed completely from the site. The Contractor shall leave the site area broom-clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition acceptable to the Owner.

3.07 SOIL ANALYSIS

Soil analysis report is the responsibility of Contractor.

END OF SECTION

SECTION 02970

LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.01 CONDITIONS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements (if any) apply to the work specified in this Section.

1.02 SCOPE OF WORK

A. Furnish all labor, material, equipment, and services required to maintain landscape in a healthy growing condition and in a neat and attractive appearance throughout the maintenance period.

B. Related Work Specified in Other Sections:
   1. SECTION 02811 - **IRRIGATION SYSTEM**
   2. SECTION 02905 - **LANDSCAPE INSTALLATION**

1.03 QUALITY ASSURANCE

The Maintenance Contractor shall be experienced in horticulture and landscape maintenance, practices, and techniques, and shall provide sufficient number of workers with adequate equipment to perform the work during the maintenance period.

1.04 MAINTENANCE PERIOD

A. Continuously maintain the entire project area during the progress of the work and during the sixty (60) calendar-day, maintenance period or until final acceptance of the project by the Landscape Architect.

B. Sections of the project may begin the maintenance period before others if project schedule is divided into thirds or an alternate schedule that is accepted by the Architect. A prime requirement is that lawn and landscape areas shall be planted and that lawn areas shall show an even, healthy stand of grass seedlings or sod, either of which shall have been mown twice. If such criteria are met to the satisfaction of the Landscape Architect, a written notification shall be issued to establish the effective beginning date of maintenance period for each section of the project.

C. Any day of improper maintenance, as determined by the Landscape Architect, shall not be credited as an acceptable maintenance period day. The maintenance period shall be extended on a daily basis if the work is not in accordance to the Plans and

Specifications. Project shall not be segmented into maintenance areas or phases unless authorization of the Landscape Architect is obtained.

D. Maintenance shall continue beyond the sixty (60) day maintenance period, as required, until final acceptance is given by the Landscape Architect.

1.05 GUARANTEE AND REPLACEMENT

A. Guarantee: All plant material and other materials installed under the Contract shall be guaranteed for one (1) year from time of final acceptance against any and all poor, inadequate or inferior materials and/or workmanship or improper maintenance, as determined by the Landscape Architect, shall be replaced by the Contractor at his expense.

B. Replacement: Any materials found to be dead, missing, or not in a satisfactory or healthy condition during the maintenance period shall be replaced immediately. The Landscape Architect shall be sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within five (5) days of written notification by the Landscape Architect. All replacement materials and installations shall comply to the Plans and Specifications. Any plant missing due to suspected theft shall be replaced by the Contractor. If the Contractor suspects that theft may be a problem, the Contractor shall provide written documentation to the Landscape Architect that security on this site needs to be intensified. The Contractor may relieve himself of theft responsibility if after the security notice, with no result, a written notice to the Landscape Architect shall be given that plant material will not be replaced for theft or vandalism due to lack of site security being maintained. This procedure may take place only during the Landscape Maintenance Period.

1.06 OBSERVATION SCHEDULE

Normal progress observations shall be requested by the Contractor from the Landscape Architect as per observations listed in specifications SECTION 02905 - **LANDSCAPE INSTALLATION**.

1.07 FINAL ACCEPTANCE OF THE PROJECT

A. Upon completion of all project work, including maintenance period, the Landscape Architect will, upon proper request, make an observation to determine final project acceptability.

B. Where observed work does not comply with the Plans and Specifications, replace rejected work and continue specified maintenance period until re-inspected by the Landscape Architect and determined to be acceptable. All replacement materials and installations shall be in accordance with the Plans and Specifications. Remove rejected work and materials immediately from project. Prior to the date of final

observation, Contractor shall provide the Owner with all Record Drawings and written Guarantee Statement in accordance with the Plans and Specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All materials used shall either conform to Specifications in other sections or shall otherwise be acceptable to the Landscape Architect. The Landscape Architect shall be given a monthly record of all herbicides, insecticides and disease control chemicals used.

B. Fertilizer – Ammonium sulfate (21-0-0)

PART 3 - EXECUTION

3.01 MAINTENANCE

A. General: Proper maintenance, including watering, weeding, mowing, edging, fertilization, repairing and protection shall be required until entire project is finally accepted, but in any event for a period of not less than the specified maintenance period after planting.

B. Watering: Thoroughly water to insure vigorous and healthy growth until work is accepted. Water in a manner to prevent erosion due to application of excessive quantities of water. When hand watering use a water wand to break the water force.

C. Weeding: Keep plant basins and areas between plants free of weeds. Control weeds with pre-emergent herbicides. If weeds develop, use legally approved herbicides. Avoid frequent soil cultivation that destroys shallow roots. Weeding also shall be included in all paved areas including public or private sidewalks.

D. Pruning
   1. Trees: Prune trees to select and develop permanent scaffold branches; to eliminate narrow V-shaped branch forks that lack strength; to reduce toppling and wind damage by thinning out crowns; to maintain a natural appearance and to balance crown with roots. Prune only as directed by the Landscape Architect.
   2. Shrubs: Same objectives as for trees. Shrubs shall not be clipped into balled boxed forms unless such is required by the landscape plans. All pruning cuts shall be made to lateral branches, buds or flush with the trunk. "Stubbing" and "heading" shall not be permitted.
   3. Only skilled workmen shall perform pruning work in accordance with standard horticultural pruning practices. Remove from the project all pruned branches and material. Remove and replace any plant material excessively pruned or

malformed resulting from improper pruning practices at no additional costs to the Owner.

E. Staking and Guying: Stakes and guys shall remain in place through the guarantee period (one year) and shall be inspected and adjusted to prevent rubbing that causes bark wounds.

F. Insect, Animal, Rodent and Disease Control: Maintain proper control with legally approved materials as required as part of the Contract.

G. Protection: The Contractor shall maintain protection of the planted areas. Damaged areas shall be repaired or replaced at the Contractor's expense.

H. Trash: Remove trash weekly in all planted areas, pedestrian walkways, and plazas.

I. Replacement: As per Guarantee and Replacement Specifications of this Section.

3.02 MAINTENANCE FERTILIZER

Fertilization: During maintenance period an application of Maintenance Fertilizer (21-0-0), shall be made at thirty (30) days and again at sixty (60) days from the date of landscape installation at a rate of five (5) pounds per 1,000 square feet, or as per manufacturer's recommendations.

3.03 IRRIGATION SYSTEM

A. System Observation: The Contractor shall check all systems for proper operation. Lateral lines shall be flushed out after removing the last sprinkler head or two at each end of the lateral. All heads are to be adjusted as necessary for unimpeded coverage.

B. Controllers: Set and program automatic controllers for seasonal water requirements. Give the Town's representative instructions on how to turn off system in case of emergency.

C. Repairs: Repair all damages to irrigation system at the Contractor's expense. Repairs shall be made within twenty-four (24) hours.

END OF SECTION