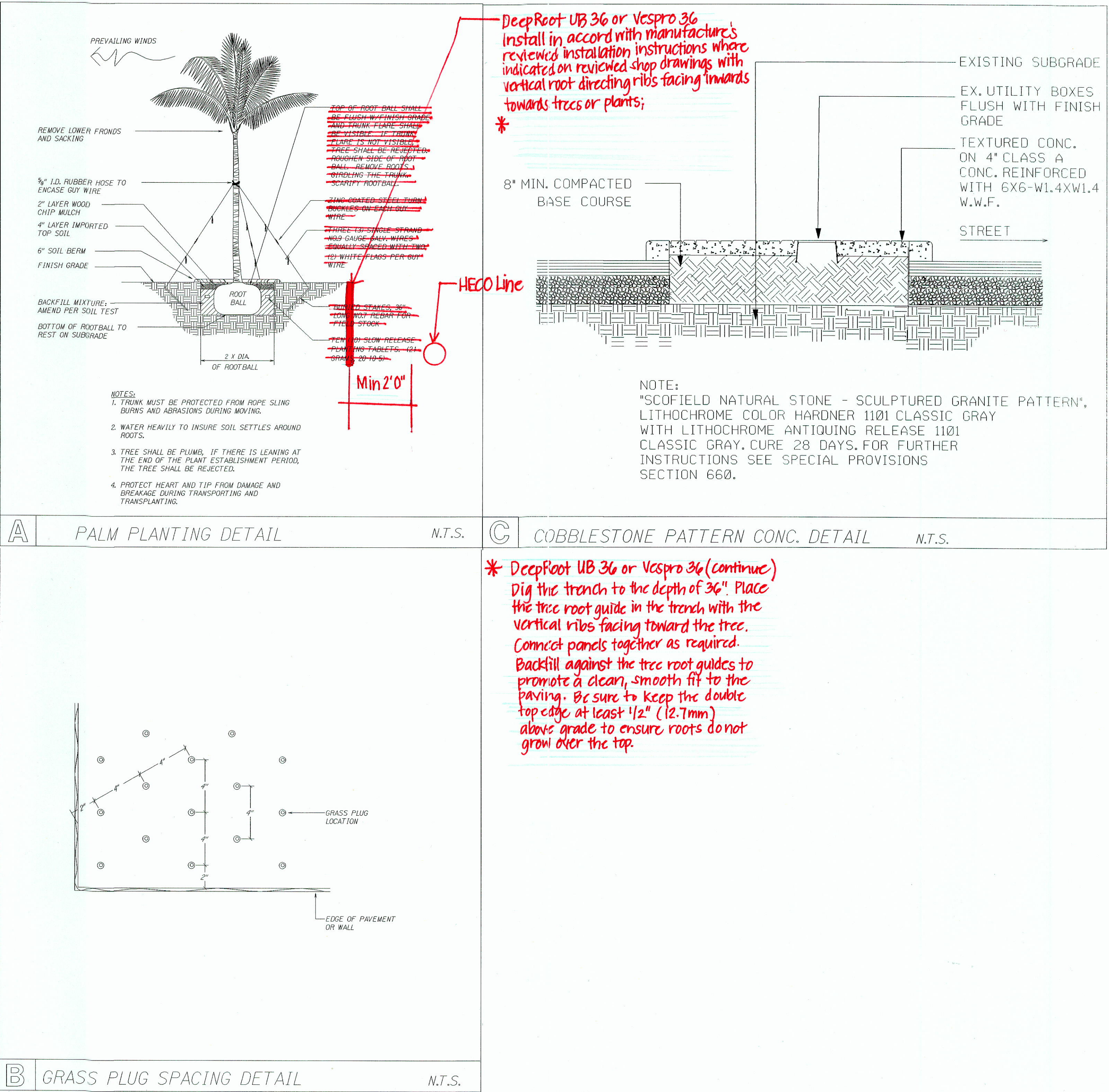


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	92A-01-07M	2007	16	17

PLANTING NOTES:

- LANDSCAPE CONTRACTOR SHALL FIELD VERIFY ALL PLANT QUANTITIES AND DIMENSIONS PRIOR TO INSTALLATION. QUANTITIES SHOWN ON PLANT LIST ARE FOR REFERENCE ONLY, VERIFY ACTUAL QUANTITIES AS SHOWN ON PLAN. IF THERE IS A DISCREPANCY, THE PLANTING PLAN SHALL TAKE PRECEDENCE.
- LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING EXISTING UTILITIES.
- PRIOR TO TREE AND SHRUB HOLE EXCAVATION, ALL PLANTING LOCATIONS SHALL BE STAKED OUT BY CONTRACTOR FOR APPROVAL BY ENGINEER. DO NOT PLANT UNTIL GROUND HAS BEEN PREPARED AND FREE OF STONES GREATER THAN 1/2", DIA., SITE IS NEAT, ORDERLY, AND THE ENGINEER ACCEPTS SITE FOR PLANTING.
- NOTIFY ENGINEER OF ANY DISCREPANCIES IN PLANT LOCATIONS OR INSUFFICIENT PLANT QUANTITIES DUE TO DIFFERENCE IN PLANS AND ACTUAL FIELD CONDITIONS.
- NOTIFY ENGINEER 30 DAYS PRIOR TO PLANTING OPERATIONS FOR APPROVAL OF ALL PLANT MATERIAL AT PLACE OF GROWTH. ALL PLANT MATERIAL NOT APPROVED BY THE ENGINEER WILL BE SUBJECT TO REJECTION.
- THE ENGINEER WILL INSPECT PLANTS AT THE PLACE OF GROWTH AND AFTER THE DELIVERY TO THE PROJECT. EACH TREE SHALL BE TAGGED BY THE DOT LANDSCAPE ARCHITECT WITH A CONSECUTIVELY NUMBERED PLASTIC TAMPER-RESISTANT AND SELF-LOCKING SEAL. SEALS SHALL REMAIN ON TREES AND ONLY BE REMOVED BY THE ENGINEER AT THE COMPLETION OF THE PLANT ESTABLISHMENT PERIOD. TREES DELIVERED TO THE PROJECT WITHOUT ENGINEERS SEAL WILL BE REJECTED.
- PLANTS SHALL MEET SIZE INDICATED BY MINIMUM HEIGHT AND SPREAD. PLANTS SHALL BE STRAIGHT AND UNIFORMLY SHAPED, UNLESS UNIQUE OR SPECIAL CHARACTERISTICS ARE SPECIFIED, AND SHALL BE UNDAMAGED, SOUND, HEALTHY, VIGOROUS AND FREE OF DISEASE AND INSECT INFESTATION. PLANTS NOT CONFORMING TO THESE REQUIREMENTS ON DELIVERY TO THE PROJECT AND AT THE END OF THE PLANT ESTABLISHMENT PERIOD WILL BE REJECTED.
- CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE COMPLETE REMOVAL AND DAMAGES RESULTING FROM PLANTING ANY PLANT SPECIES LISTED ON THE HAWAII DEPARTMENT OF AGRICULTURE 'NOXIOUS WEED RULES' AS DEFINED IN THE STATUTE, HAWAII ADMINISTRATIVE RULES 4-68-1 OR THE 'FEDERAL NOXIOUS WEED LIST' AS DEFINED IN TITLE 7 OF THE CODE OF FEDERAL REGULATIONS (CFR), PARTS 360 AND 361.
- ALL TREE WORK MUST ADHERE TO AMERICAN NATIONAL STANDARD INSTITUTE (OR ANSI) - A300 TREE CARE STANDARDS AND ANSI-Z133 SAFETY STANDARDS FOR TREE WORK. WORK SHALL BE CONTRACTED TO ARBORISTS THAT HAS BEEN CERTIFIED IN GOOD STANDINGS AS AN ISA CERTIFIED ARBORIST FOR AT LEAST 5 YEARS TO ASSURE THAT TREE WORK IS PERFORMED PROPERLY AND TREES ARE NOT DAMAGED BY PRACTICES SUCH AS TOPPING, FLUSH CUTS, OVER-THINNING, OR CLIMBING WITH SPIKES. CONTRACTOR SHALL SUBMIT A COPY OF THE ISA ARBORIST CERTIFICATION OF GOOD STANDING OF 5 YEARS TO THE ENGINEER MINIMUM 7 DAYS PRIOR TO TREE PRUNING.
- CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY TREE/UTILITY CONFLICTS. THE TREE SHALL BE RELOCATED OR ELIMINATED AS DETERMINED BY THE DOT LANDSCAPE ARCHITECT.
- IF TREES OTHER THAN THOSE SPECIFICALLY DESIGNATED FOR REMOVAL ARE DAMAGED BEYOND SURVIVAL CONDITIONS AS DETERMINED BY ENGINEER, THE CONTRACTOR SHALL REMOVE SUCH TREES AND REPLACE THE TREE WITH A SAME SPECIE AND SIZE AND MAINTAIN FOR THE DURATION OF CONSTRUCTION OR 12 MONTHS WHICHEVER IS GREATER AT NO COST TO THE STATE.
- PROVIDE EVEN FOUR-INCH LAYER OF PLANTING SOIL OVER ALL PLANTING AREAS. REPRESENTATIVE SAMPLES OF SOIL FROM PROJECT SITE SHALL BE SUBMITTED TO THE UNIVERSITY OF HAWAII AGRICULTURAL EXTENTION SERVICE OR LABORATORY ACCEPTABLE TO THE ENGINEER FOR ANALYSIS OF REQUIRED SOIL AMENDMENTS. TEST RESULTS AND FERTILIZATION SCHEDULE SHALL BE PRESENTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE BEFORE PLACING PLANTING SOIL. UNIFORMLY DISTRIBUTE FERTILIZER AND AMENDMENTS OVER PLANTING AREAS AS RECOMMENDED BY THE SOIL ANALYSIS REPORT. ROTOTILL TOP FOUR-INCHES OF SOIL TO EVENLY INCORPORATE FERTILIZER AND AMENDMENTS. AFTER COMPLETION OF SOIL AMENDMENTS, RETEST TO MEET SOIL ANALYSIS. CONTINUE AMENDING UNTIL TEST MEETS SOIL TEST RECOMMENDATIONS. PROVIDE COPY OF ALL SOIL TESTS TO ENGINEER
- GUY WIRES, FLAGGING, STAKES, WINDBREAKERS, ETC. SHALL BE MAINTAINED AND REPLACED IF NECESSARY BY THE CONTRACTOR UNTIL THE TREE OR SHRUB IS ABLE TO STAND BY ITSELF. THE CONTRACTOR SHALL REMOVE AND DISPOSE AT THE END OF PLANT ESTABLISHMENT PERIOD.
- ANY PLANTING THAT OBSTRUCTS SIGHT DISTANCE, SIGNS OR TRAFFIC LIGHTS SHALL BE RELOCATED OR REMOVED AS DETERMINED BY THE ENGINEER.
- PROTECT EXISTING STATE SURVEY MONUMENTS. ADJUST TREES THAT CONFLICT WITH SURVEY MONUMENTS AS DETERMINED BY THE ENGINEER. REPORT ANY CONFLICTS TO STATE DOT SURVEYOR DANIEL SASAKI AT 831-6807.

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE & NOTES
CN	64	COCOS NUCIFERA	COCONUT TREE	15' BRN TRUNK MIN. FIELD STOCK, STRAIGHT TRUNK
SS	18,000 SF	STENOTAPHRUM SECUNDATUM	ST AUGUSTINE GRASS	6" SPRIGS, 4" O.C.



SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**PLANTING DETAILS**

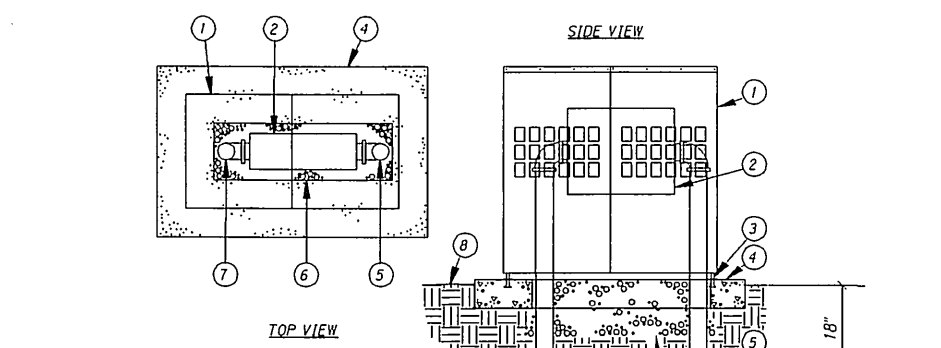
**NIMITZ HIGHWAY BEAUTIFICATION**  
**NUUANU STREAM BRIDGE TO BETHEL STREET**  
**PROJECT NO. 92A-01-07M**

Date: March, 2007

SHEET No. 16 OF 17 SHEETS

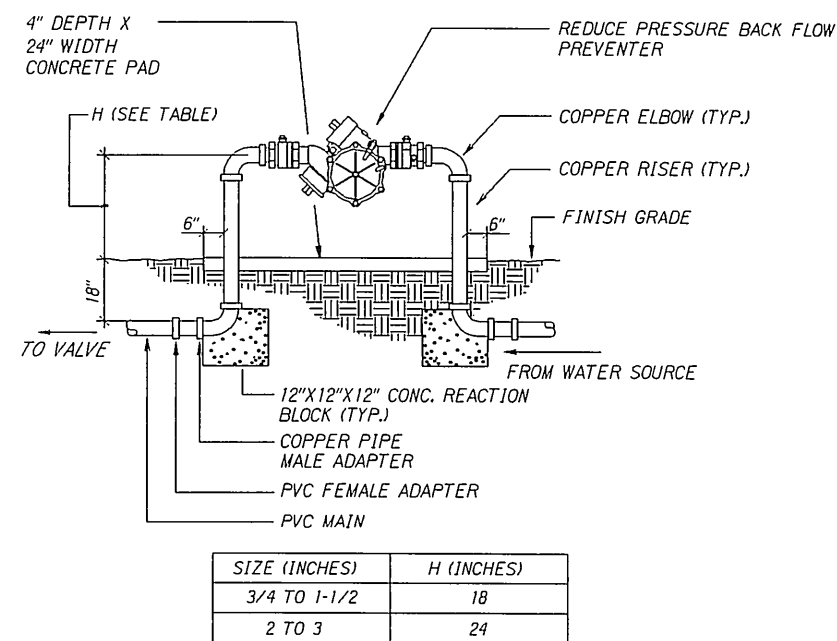


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	92A-01-07M	2007	17	17

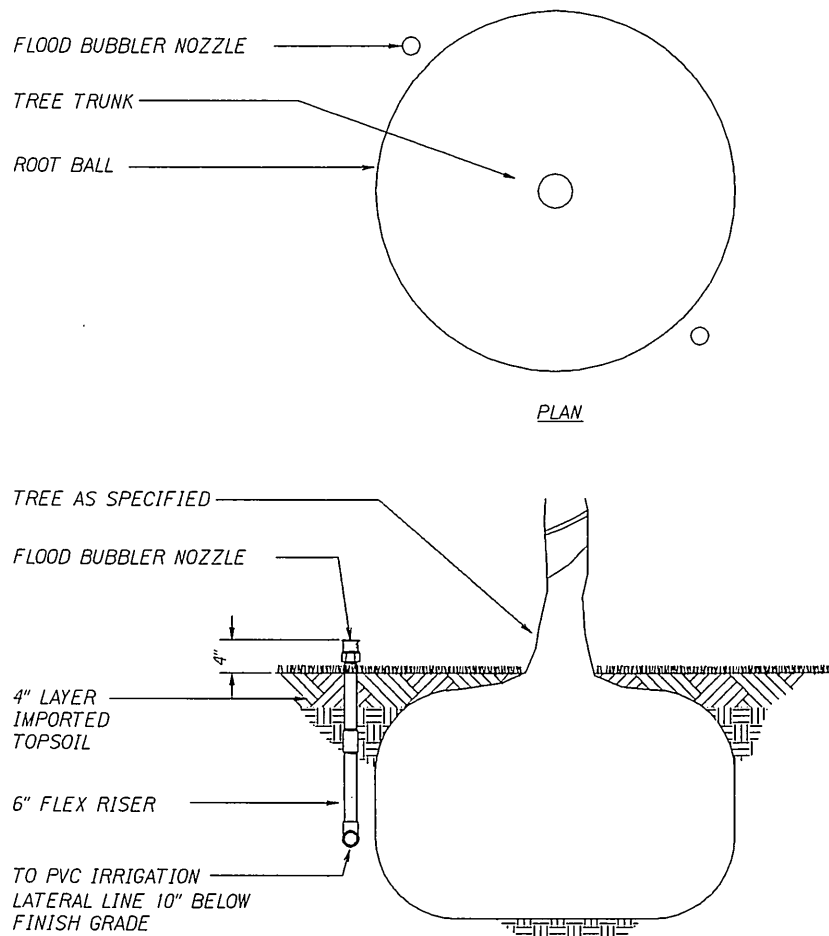


LEGEND

- BACK FLOW PREVENTER ENCLOSURE MADE BY V.I.T. PRODUCTS INC STRONGBOX SB80-1555, LABELED W/ DOT IRRIGATION BACKFLOW PREVENTOR MARKER ACCEPTABLE TO ENGINEER.
  - BACK FLOW PREVENTER
  - ANCHOR ROD (TYP.)
  - POURED CONCRETE BASE - 6" MIN. THICKNESS - EXTEND 4" BEYOND OUTSIDE DIMENSIONS OF ENCLOSURE.
  - WATER SERVICE INLET PIPING.
  - 4" LAYER ¾" DIA WASHED ROCK.
  - WATER SERVICE OUTLET PIPING.
  - FINISH GRADE.
- NOTES:
- CONTRACTOR SHALL PROVIDE PADLOCK FOR DURATION OF THE PROJECT.
  - BACK FLOW PREVENTER SHALL BE LOCATED IN AN AREA WELL PROTECTED FROM VEHICLES (CLEAR ZONE). IF THE BACK FLOW PREVENTOR IS LOCATED IN AN UNPROTECTED AREA, THEN FOUR (4) 6" PIPE BOLLARDS FILLED WITH CONCRETE SHALL BE PLACED AT THE FOUR CORNERS OF THE BACK FLOW PREVENTER. PAINT BOLLARDS 'FOREST GREEN'. COPPER PIPE SHALL BE PAINTED TO CONCEAL COPPER METAL.



- NOTES:
- ALL PIPES AND FITTINGS INSTALLED ABOVE GRADE SHALL BE EITHER COPPER OR BRONZE ONLY.
  - BACK FLOW PREVENTER SHALL BE PLUMB.
  - BACK FLOW PREVENTER SHALL BE LOCATED IN AN AREA WELL PROTECTED FROM VEHICLES (CLEAR ZONE). IF THE BACK FLOW PREVENTOR IS LOCATED IN AN UNPROTECTED AREA, THEN FOUR (4) 6" PIPE BOLLARDS FILLED WITH CONCRETE SHALL BE PLACED AT THE FOUR CORNERS OF THE BACK FLOW PREVENTER. PAINT BOLLARDS 'FOREST GREEN'. COPPER PIPE SHALL BE PAINTED TO CONCEAL COPPER METAL.



NOTE: TWO TREE BUBBLERS FOR EACH TREE.

B.F.P. ENCLOSURE DETAIL

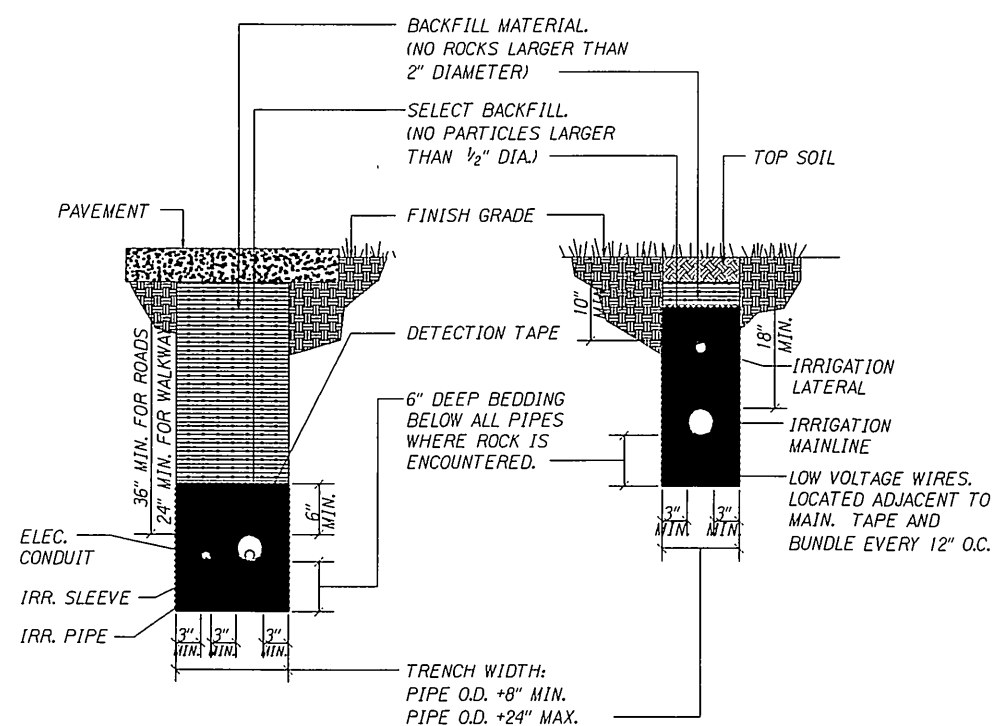
N.T.S.

REDUCED PRESSURE B.F.P DETAIL

N.T.S.

TREE BUBBLER DETAIL

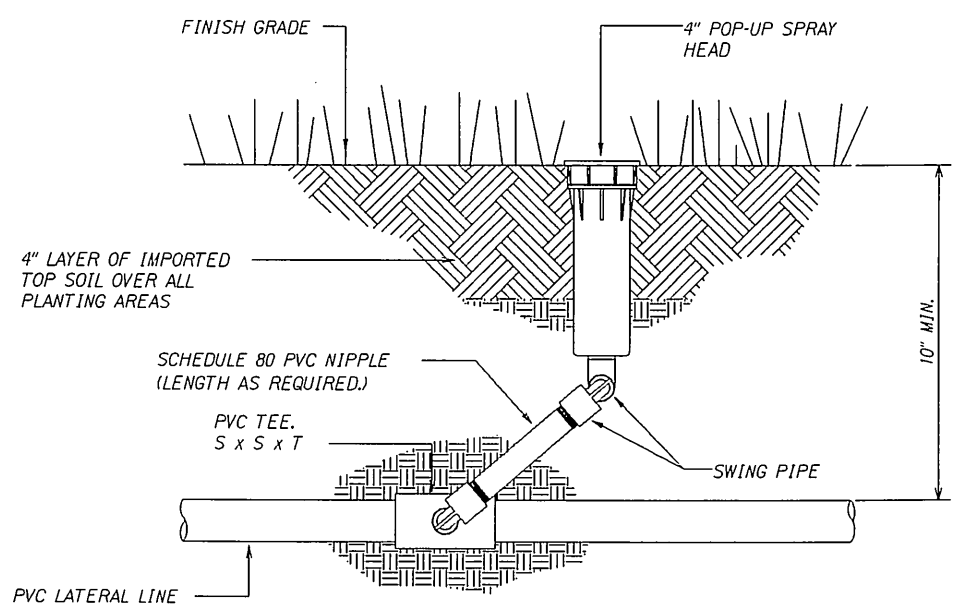
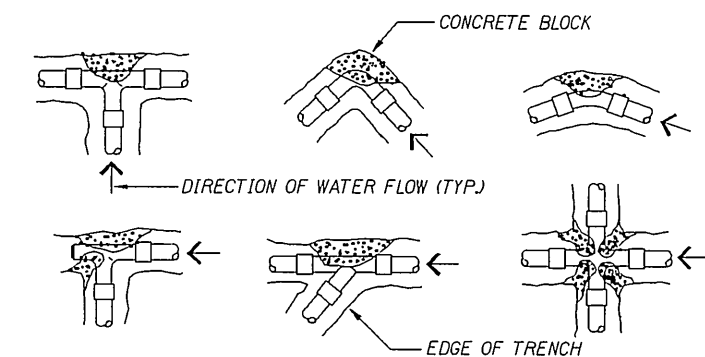
N.T.S.



THRUST BLOCK BEARING AREA (SQ. FT.)				
PIPE SIZE	1 1/4" - 2 1/2"	3"	4"	6"
TEES/ELLS	1.00	1.00	1.25	3.2
90 BENDS	1.00	1.25	2.00	4.5
45 BENDS	1.00	1.00	1.00	2.4

NOTES:

- INSTALL THRUST BLOCK AT ALL MACHINE BENDS, TEES OR ELLS AS SHOWN BELOW. THRUST BLOCKS SHALL BE MINIMUM OF (1) CU. FT. RECYCLED CONCRETE OR 250 PSI OR IN CONCRETE.
- SET ALL THRUST BLOCKS AGAINST UNDISTURBED SOIL.



- NOTE:
- XBI OR LASCO SWING JOINTS MAY BE USED UPON APPROVAL BY ENGINEER
  - INSTALL PART CIRCLE POP-UP HEADS 6" FROM EDGE OF PAVED AREAS.

IRRIGATION TRENCH DETAIL

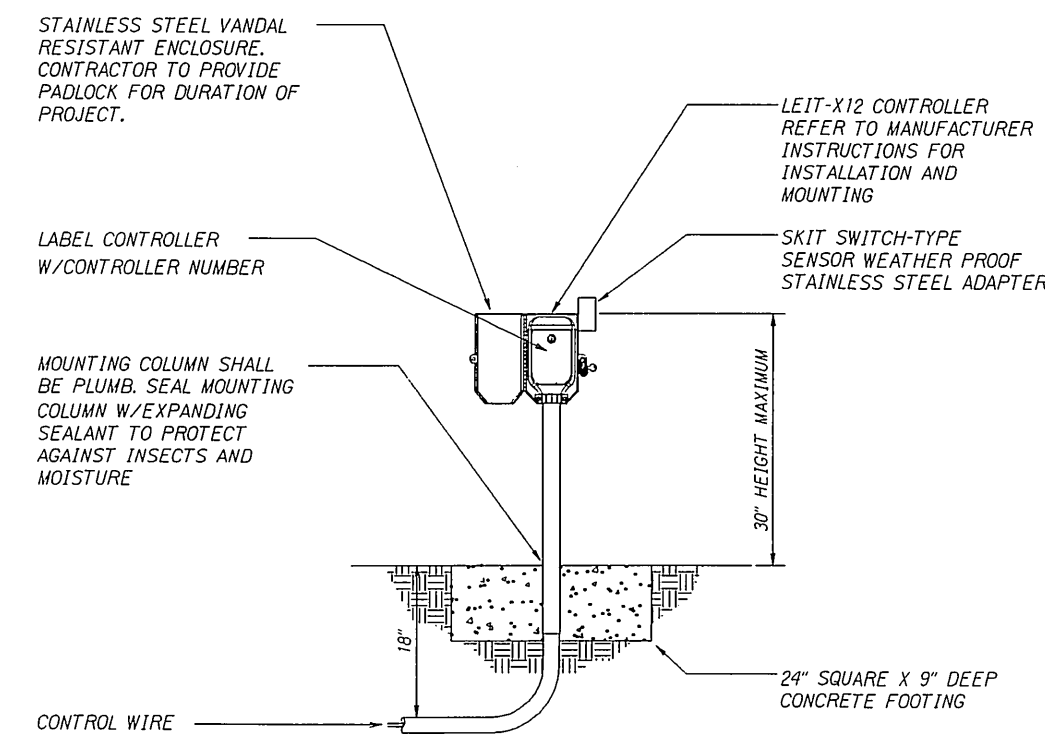
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THRUST BLOCK DETAIL

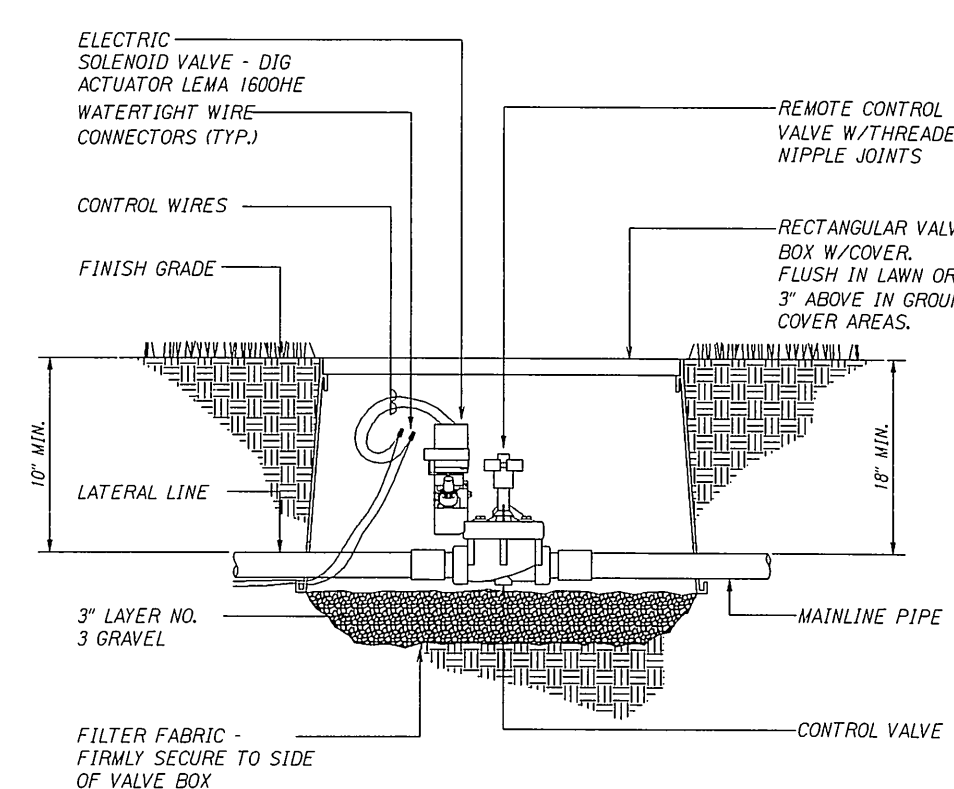
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LAWN POP-UP SPRINKLER DETAIL

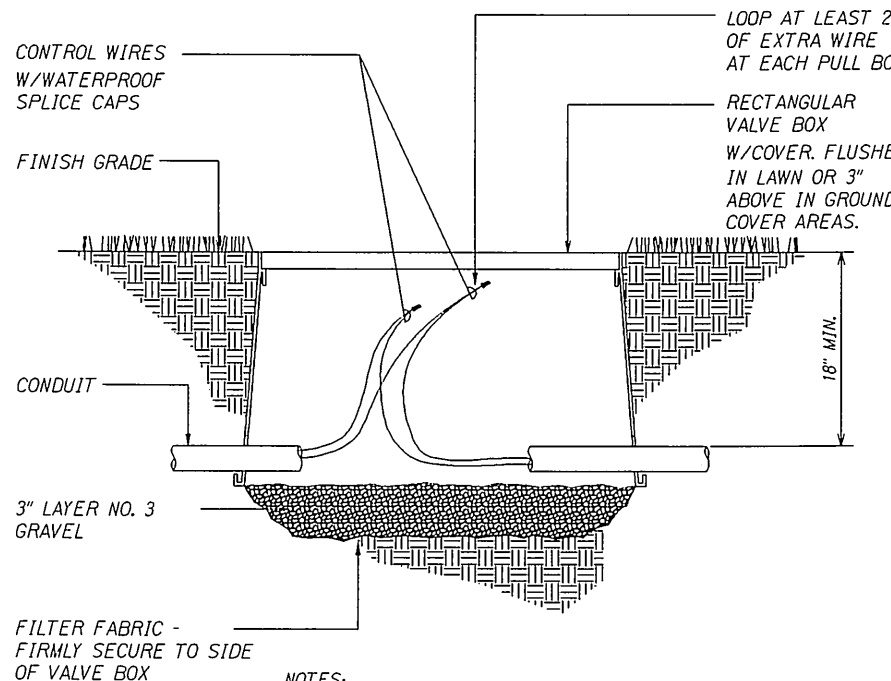
N.T.S.



NOTE:  
CONTROLLER LOCATION SHALL BE LOCATED IN AN AREA WELL PROTECTED FROM VEHICLES. IF THE CONTROLLER IS LOCATED IN AN UNPROTECTED AREA, THEN FOUR 6" PIPE BOLLARDS FILLED W/ CONCRETE SHALL SURROUND CONTROLLER. PROVIDE ONE (1) LEFT KEY PER CONTROLLER.



NOTE:  
ALL VALVE BOX COVERS SHALL BE LABELED RECYCLED WATER (IF APPLICABLE), VALVE TYPE, ZONE NUMBER AND CONTROLLER NUMBER



- NOTES:
- ALL VALVE BOX COVERS SHALL BE LABELED VALVE TYPE, ZONE NUMBER AND CONTROLLER NUMBER.
  - PROVIDE MINIMUM OF ONE PULL BOX FOR EVERY 250 LINEAR FEET OF CONTROLLER WIRE AND AT EACH GROUPING OF VALVES AND PRIOR TO ALL ROAD PAVEMENT CROSSINGS.
  - DO NOT SPLICE WIRES EXCEPT IN VALVE BOXES AND PULL BOXES.

IRRIGATION CONTROLLER DETAIL

N.T.S.

REMOTE CONTROL VALVE DETAIL

N.T.S.

PULL BOX DETAIL

N.T.S.

IRRIGATION EQUIPMENT LIST

SYMBOL	QUANTITY	MANUFACTURER CATALOG NUMBER	DESCRIPTION	G.P.M.	RADIUS	P.S.I.
⊕	11	RAINBIRD 100-PEB-PRS-D W/ DIG ACTUATOR LEMA 1600HE	1" REMOTE CONTROL VALVE W/ ACTUATOR			
⊗	5	RAINBIRD 150-PEB-PRS-D W/ DIG ACTUATOR LEMA 1600HE	1 1/2" REMOTE CONTROL VALVE W/ ACTUATOR			
■	35	RAINBIRD 1804-SAM-PRS-155Q	4" POP-UP SPRAY HEAD W/ 15' SQUARE/FULL	3.73	23' x 23'	30
■	26	RAINBIRD 1804-SAM-PRS-155ST	4" POP-UP SPRAY HEAD W/ 4'X30'/HALF	1.21	4' x 30'	30
■	6	RAINBIRD 1804-SAM-PRS-15EST	4" POP-UP SPRAY HEAD W/ 4'X15'/QTR	0.61	4' x 15'	30
●	48	RAINBIRD 1804-SAM-PRS-10F	4" POP-UP SPRAY HEAD W/ 10' RADIUS/FULL	1.58	10'	30
●	2	RAINBIRD 1804-SAM-PRS-10H	4" POP-UP SPRAY HEAD W/ 10' RADIUS/HALF	0.79	10'	30
●	128	RAINBIRD 1804-SAM-PRS-16-H-SLA-PCS-090	4" POP-UP SPRAY HEAD W/ STREAM BUBBLER	1.60	5'	30
⊕	2	DIG LEIT X12 W/ ENCL4000 SECURITY ENCLOSURE W/ HUNTER MINI-CLIK RAIN SENSOR W/SENSOR GUARD SG-MC	12 STATION IRR. CNTLR. W/RAIN SENSOR			
—	2	1 1/4" FEBCO 805Y or B.W.S. APPROVED EQUAL W/ENCLOSURE	BACKFLOW PREVENTER			
—		PVC SCHEDULE 40	IRRIGATION MAIN			
—		PVC SCHEDULE 40	IRRIGATION LATERAL			
—		PVC SCHEDULE 40	EXISTING IRRIGATION SLEEVE			

IRRIGATION NOTES:

- CONTRACTOR SHALL INSTALL IRRIGATION LINES, WIRES, VALVES AND HEADS PER SPECIFICATIONS. EXISTING GATE VALVES, POINT OF CONNECTION, ETC. ARE DERIVED FROM THE BEST AVAILABLE INFORMATION AND ON-SITE INSPECTION. THE CONTRACTOR SHALL VERIFY THOSE POINTS OF CONNECTION NOTED AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
- THIS PLAN IS DIAGRAMMATIC. IRRIGATION SYSTEM IS SUBJECT TO FIELD ADJUSTMENTS DUE TO UNANTICIPATED SITE CONDITIONS. LOCATE ALL MAINLINES, LATERALS, VALVES AND SPRINKLER HEADS WITHIN PLANTING AREAS, UNLESS OTHERWISE NOTED. PLACE MAINLINE IN PLANTING AREAS WHERE NO SLEEVES ARE SHOWN. AVOID ANY CONFLICT BETWEEN UNDERGROUND UTILITIES, STRUCTURES AND PLANTINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES. BURY PRESSURE MAINLINES 18" AND LATERAL LINES 10" DEEP MINIMUM.
- THIS IRRIGATION SYSTEM WAS DESIGNED WITH A MINIMUM STATIC WATER PRESSURE OF 75 PSI AT THE POINT OF CONNECTION. NOTIFY THE PROJECT ENGINEER, IF WATER PRESSURE IS LESS THAN 35 PSI OR GREATER THAN 75 PSI.
- CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND OBSERVE ALL LOCAL CODES AND REGULATIONS. THE CONTRACTOR SHALL CONFIRM ALL SITES DIMENSIONS AND CONDITIONS, AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
- CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL SLEEVES, CONDUITS, MAINLINES AND LATERALS UNDER PAVEMENT AND THROUGH WALLS. CONTRACTOR SHALL ASSURE THAT THESE ITEMS ARE LAID PRIOR TO PLACEMENT OF PAVEMENT OR WALL STRUCTURES.
- LOCATE AND INSTALL ALL SPRINKLER HEADS 6" FROM SIDEWALKS, CURBS, DRIVEWAYS, BUILDING AND WALL UNLESS OTHERWISE NOTED. FLEX TUBING SHALL BE INSTALLED ON ALL SPRINKLER HEAD ALONG SIDEWALKS, DRIVEWAYS, AND PARKING SPACES. ADJUST ALL SPRINKLER HEADS AND FLOW CONTROL FOR MAXIMUM COVERAGE AND MINIMUM OVERTHROW AND MISTING. OPERATE ONLY ONE VALVE AT A TIME PER CONTROLLER.
- WITHIN 30 DAYS AFTER AWARD OF THE CONTRACT, SUBMIT FOR THE ENGINEER'S ACCEPTANCE SIX (6) COPIES OF DETAILED SCALED DRAWINGS AND WIRING DIAGRAMS FOR PERMANENT AND TEMPORARY IRRIGATION SYSTEMS. NOT PROPOSED DEVIATIONS FROM THE CONTRACT. INCLUDE SAMPLES OF MATERIALS, IF REQUIRED BY CONTRACT.
- PERFORM HYDROSTATIC TEST BY APPLYING CONTINUOUS STATIC PRESSURE OF 60 PSI FOR ONE (1) HOUR. NOTIFY THE ENGINEER AT LEAST THREE (3) DAYS IN ADVANCE OF TEST. REPAIR LEAKS THAT DEVELOP AND REPEAT TEST. DO NOT BACKFILL UNTIL THERE IS NO FURTHER SIGN OF LEAKAGE.
- PERFORM OPERABILITY TEST BY OPENING REMOTE CONTROL VALVE AND TEST CIRCUITS FOR LEAKS AROUND BARBED AND THREADED PVC FITTINGS. REPAIR LEAKS AND REPEAT TESTS. NOTIFY THE ENGINEER AT LEAST THREE (3) DAYS IN ADVANCE OF TEST. DO NOT BACKFILL UNTIL THERE IS NO FURTHER SIGN OF LEAKAGE.
- PERFORM COVERAGE TEST. BEFORE PLANTING PERIOD, RUN AUTOMATIC CONTROLLER THROUGH ALL ITS CYCLES. CHECK WATERING FOR COVERAGES AND UNIFORMITY IN COMPANY OF THE ENGINEER. RUN SYSTEM UNTIL THERE ARE PUDDLES OR THERE IS SHEET FLOW TO DETERMINE INITIAL IRRIGATION TIME AND NUMBER OF CYCLES PER WEEK NEEDED TO WATER REQUIREMENTS OF PLANTS.
- LOCATE VALVE BOXES SO THAT THE OUTER EDGES ARE NO CLOSER THAN FIVE FEET TO ROADWAY PAVEMENT. GROUP VALVE BOXES AS FEASIBLE.
- IF PLANS DO NOT SPECIFY DEPTH OF EXCAVATION, PROVIDE MINIMUM COVER TO FINISH GRADE AS FOLLOWS:
  - 4 INCHES FOR DRIP IRRIGATION MAIN.
  - 18 INCHES FOR IRRIGATION MAIN.
  - 10 INCHES FOR IRRIGATION LATERAL
  - 24 INCHES FOR SLEEVE OR CONDUIT UNDER LANDSCAPE PAVEMENT.
  - 36 INCHES FOR SLEEVE OR CONDUIT UNDER ROADWAY PAVEMENT.
  - FOR CONTROLLER WIRES AND CONDUITS IN UNPAVED AREAS, DEPTH EQUAL TO THAT OF PRESSURE IRRIGATION PIPE.
- NO ADDITIONAL IRRIGATION WATER DEMAND WILL BE REQUIRED. EXISTING METERS, #1143339, 1115968 ARE ADEQUATE TO SERVE THE IRRIGATION SYSTEM. HAVE WATER METERS REINSTALLED PRIOR TO ANY CONSTRUCTION.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

IRRIGATION DETAILS

NIMITZ HIGHWAY BEAUTIFICATION  
NUUANU STREAM BRIDGE TO BETHEL STREET  
PROJECT NO. 92A-01-07M

Date: March, 2007

SHEET No. 17 OF 17 SHEETS