IRRIGATION SPECIFICATIONS:

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 WORK OF THIS SECTION.

1.2 WORK INCLUDED:

A. WORK OF THIS SECTION PROVIDES A PERFORMANCE SPECIFICATION FOR THE DESIGN AND INSTALLATION OF A COMPLETE IRRIGATION SYSTEM FOR THE PROJECT.

1.3 QUALITY ASSURANCES:

A. APPLICABLE REQUIREMENTS OF ACCEPTED STANDARDS AND CODES SHALL APPLY TO THE WORK OF THIS SECTION:

1. ASTM - AMERICAN SOCIETY FOR TESTING MATERIALS.

D2241: POLYVINYL CHLORIDE (PVC) PLASTIC PIPE (SDR-PR).
D2287: FLEXIBLE POLYVINYL CHLORIDE (PVC).
D2464: POLYVINYL CHLORIDE (PVC) PLASTIC PIPE FITTINGS, THREADED, SCHEDULE 80.
D2466: POLYVINYL CHLORIDE (PVC) PLASTIC PIPE FITTINGS, SOCKET TYPE, SCHEDULE 40.
D2564: SOLVENT CEMENTS FOR POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS.
D2855: MAKING SOLVENT - CEMENTED JOINTS FOR POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS.

2. NATIONAL PLUMBING CODE (NPC)

3. NATIONAL ELECTRIC CODE (NEC)

4. NATIONAL SANITARY FOUNDATION (NSF)

1.4 DEFINITION:

A. IRRIGATION DESIGN: DESIGN OF IRRIGATION SYSTEM TO MEET DESIGNER AND CITY OF JACKSONVILLE AND / OR LOCAL WATER AUTHORITY STANDARD SPECIFICATIONS. IRRIGATION DESIGN TO BE COMPLETED BY LICENSED IRRIGATION CONTRACTOR IN THE STATE OF NORTH CAROLINA. CONTRACTOR RESPONSIBLE TO OBTAIN ANY APPROVALS/ PERMITS REQUIRED BY THE CITY OF JACKSONVILLE AND / OR LOCAL WATER AUTHORITY.

B. IRRIGATION MAINS: THAT PORTION OF PIPING FROM WATER SOURCE TO REMOTE CONTROL VALVES. THIS PORTION OF PIPING IS SUBJECT TO SURGES, BEING A CLOSED PORTION OF IRRIGATION SYSTEM. HYDRANT LINES (QCV) ARE CONSIDERED PART OF MAIN LINE PIPING SYSTEM.

C. LATERAL PIPING: THAT PORTION OF PIPING FROM REMOTE CONTROL VALVE TO SPRINKLER HEADS AND TUBING.

1.5 SYSTEM DESCRIPTION:

A. DESIGN AND INSTALL TO PROVIDE COMPLETE COVERAGE FOR LAWN AND PLANTING AS FOLLOWS:

- ALL HYDROSEEDED LAWN AREAS
- ALL NEW SODDED AREAS, SHRUB BEDS AND TREE PLANTING AREAS, INCLUDING PARKING LOT ISLANDS. DESIGN, FURNISH AND INSTALL AN OPERATING SYSTEM, COMPLETE WITH ELECTRICAL CONNECTION, BACKFLOW PREVENTERS, AUTOMATIC CONTROLLERS, MAIN AND LATERAL LINES, SPRINKLER HEADS, REMOTE CONTROL VALVES, QUICK COUPLER VALVES, WIRES AND ANY OTHER ITEMS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

1.6 SUBMITTALS:

A. IRRIGATION MAINTENANCE AND OPERATING INSTRUCTION MANUAL: MANUFACTURER'S LITERATURE FOR APPROVED PRODUCTS IN TRIPLICATE, NEATLY BOUND IN A BLACK VINYL THREE RING BINDER WITH COVER ENTITLED "IRRIGATION MAINTENANCE AND OPERATING INSTRUCTION MANUAL" WITH NAME AND ADDRESS OF PROJECT, DATE OF SUBMISSION, AND NAME AND ADDRESS OF DESIGNER AND CONTRACTOR. INCLUDE PARTS NUMBERS ACTUALLY USED. SUPPLIER'S NAME, ADDRESS, AND TELEPHONE, AND SCHEDULED INSPECTIONS REQUIRED. ALSO INCLUDE A SUGGESTED SYSTEM OPERATING SCHEDULE WITH PRECIPITATION RATES FOR EACH ZONE. MANUFACTURER'S LITERATURE SHALL INCLUDE THE FOLLOWING:

1. SPRINKLER HEADS
2. VALVES: MANUAL AND AUTOMATIC
3. CONTROLLER
4. VALVE BOXES
5. PIPE, TUBING, AND FITTINGS
6. WIRE
7. METER
8. BACKFLOW PREVENTION DEVICE
9. MISC. MATERIALS SUCH AS RAIN AND TEMPERATURE CHECK DEVICES ETC.

B. PROJECT RECORD DOCUMENTS:

1. SUBMIT PRELIMINARY DESIGN TO OWNER/ENGINEER FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
2. MAINTAIN IN GOOD ORDER AT SITE, ONE COPY OF APPROVED DESIGN DRAWINGS, SPECIFICATIONS, ADDENDA AND APPROVED CHANGE ORDERS, AND RECORD CHANGES AND OTHER MODIFICATIONS MADE DURING CONSTRUCTION.
3. UPON COMPLETION OF WORK, TRANSPOSE CHANGES TO MYLAR AND SUBMIT A COPY OF THE AS- BUILT DRAWING WITH EACH PRODUCT DATA MANUAL.
4. SUBMIT COMPLETE PRODUCT DATA MANUAL WITH AS-BUILT TO THE ENGINEER PRIOR TO ISSUANCE OF FINAL ACCEPTANCE. AS BUILT-DRAWING TO INCLUDE LOCATION, BY WRITTEN DIMENSION, OF MAINLINE PIPING, REMOTE CONTROL VALVES AND QUICK COUPLER VALVES. TITLE "RECORD DRAWING" AND INCLUDE DATE, SIGNATURE, AND LICENSE OF INSTALLER.

1.7 PROJECT/SITE CONDITIONS:

A. WATER SUPPLY: OWNER WILL PROVIDE WATER FOR REQUIRED TESTING, FLUSHING AND JETTING.

B. ELECTRICAL SUPPLY: CONTRACTOR SHALL BE REQUIRED TO MAKE FINAL CONNECTION TO CONTROLLER.

C. SLEEVES AND DUCTS: PROVIDE SLEEVES AND/OR DUCTS AT ALL ROAD/PAVEMENT CROSSINGS. EXTEND SLEAVES UNDER PAVING 18" MIN. BEYOND PAVING AND CAP LINES HANDTIGHT. DO NOT USE AS MAIN OR LATERAL LINES.

D. EXISTING UTILITES AND STRUCTURES: REVIEW UTILITY STRUCTURE AS-BUILTS AND CONSULT WITH THE APPROPRIATE UTILITY COMPANES FOR LOCATION PRIOR TO COMMENCING INSTALLATION. REPAIR DAMAGE DUE TO INSTALLATION IMMEDIATELY. MAKE NECESSARY ADJUSTMENTS IN THE LAYOUT AS MAY BE REQUIRED TO CONNECT TO EXISTING STUBOUTS, AS MAY BE REQUIRED TO WORK AROUND EXISTING CONDITIONS.

E. STORAGE: SPACE WILL BE DESIGNATED AT THE SITE.

F. DELIVER MATERIALS IN ORIGINAL PACKAGE, CARTONS, AND CONTAINERS BEARING THE NAME OF MANUFACTURER, BRAND, AND MODEL NUMBER.

G. PROTECT IRRIGATION SYSTEM MATERIALS BEFORE, DURING AND AFTER INSTALLATION. EXERCISE CARE IN HANDLING, LOADING, UNLOADING, COVERING AND STORING PLASTIC PIPE AND FITTINGS UNTIL READY TO INSTALL.

H. IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE REPAIRS AND REPLACEMENTS NECESSARY AT NO ADDITIONAL COST TO OWNER.

1.8 SCHEDULING:

A. COORDINATE WITH LANDSCAPE CONTRACTOR AND HIS LANDSCAPE WORK.

B. PREPARE A DETAILED SCHEDULE COORDINATED WITH THE WORK OF OTHER CONTRACTORS DOING WORK AT THE SITE.

C. MONITOR SCHEDULES ON A REGULAR BASIS SO POTENTIAL VARIANCES CAN BE DETERMINED AND RESOLVED.

D. VERIFY ALL PRODUCT ORDERS SO DELIVERIES ARE TIMED TO MAINTAIN CONSTRUCTION SCHEDULES.

1.9 WARRANTY:

A. FULLY GUARANTEE MATERIALS AND WORKMANSHIP FOR ONE YEAR AFTER ISSUANCE OF FINAL ACCEPTANCE.

B. LIMIT GUARANTEE TO REPAIR AND REPLACEMENT OF DEFECTIVE MATERIALS OR WORKMANSHIP AND REPAIR OF BACKFILL SETTLEMENT.

C. THE INSTALLATION OF THE IRRIGATION WORK SHALL BE MADE BY AN INDIVIDUAL OR FIRM DULY LICENSED. ALL IRRIGATORS WILL BE REQUIRED TO SHOW THEIR CURRENT UPDATED LICENSE FOR THE CURRENT YEAR. D. COMPLY WITH LOCAL AND STATE LAWS, CODES, AND ORDINANCES APPLICABLE TO THIS PROJECT, AS WELL AS THE NATIONAL ELECTRICAL CODE FOR ELECTRICAL WORK AND MATERIALS.

1.10 MAINTENANCE:

A. PROVIDE MAINTENANCE OF SYSTEM INCLUDING CLEANING AND ADJUSTMENT OF HEADS, RAISING AND LOWERING OF HEADS, CLEANING FILTERS, FLUSHING LATERAL LINES AND TUBING UNTIL FINAL ACCEPTANCE.

B. REPAIR BACKFILL SETTLEMENT OF TRENCHES PRIOR TO ACCEPTANCE.

C. DRAIN AND FLUSH SYSTEM WITHIN ONE-YEAR GUARANTEE PERIOD.

D. INSTRUCT OWNER AND OWNER'S PERSONNEL IN OPERATION AND GENERAL MAINTENANCE OF SYSTEM. PROVIDE OWNER WITH A MAINTENANCE MANUAL OF MATERIALS INSTALLED BOUND IN A THREE-RING BLACK VINYL BINDER.

E. REPAIR OF DAMAGE CAUSED BY VANDALS, OTHER CONTRACTORS OR WEATHER CONDITIONS SHALL BE CONSIDERED EXTRA TO THE WORK.

F. MAINTAIN THE ENTIRE IRRIGATION SYSTEM IN PROPER WORKING ORDER AND PROGRAM THE CONTROLLERS IN CONSULTATION WITH LANDSCAPE CONTRACTOR PRIOR TO FINAL ACCEPTANCE.

G. PROVIDE THE OWNER WITH A LETTER SUMMARIZING THE ONE-YEAR WARRANTY AND TIMEFRAME STATED IN THIS SPECIFICATION AND DATE OF FINAL ACCEPTANCE. THIS LETTER SHALL SERVE AS THE CONTRACTOR'S WRITTEN GUARANTEE.

2.0 EXTRA EQUIPMENT:

A. THREE (3) QUICK COUPLER KEYS WITH ONE HOSE SWIVEL AND ONE BRASS BOILER DRAIN EACH.

B. THREE (3) KEYS TO CONTROLLER.

C. FIVE (5) SPARE SPRINKLER HEADS, (EACH TYPE).

PART 2 PRODUCTS

2.1 POLYVINYL CHLORIDE PIPE

A. MANUFACTURED IN ACCORDANCE WITH STANDARDS NOTED HEREIN:

1. MARKING AND IDENTIFICATION: CONTINUOUSLY AND PERMANENTLY MARKED WITH MANUFACTURER'S NAME, PIPE SIZE, PIPE TYPE AND MATERIAL, SDR NUMBER, ASTM STANDARD NUMBER AND NSF (NATIONAL SANITATION FOUNDATION) SEAL.
2. PIPE FITTINGS: OF SAME MATERIAL AS PVC PIPE SPECIFIED AND COMPATIBLE WITH PVC PIPE FURNISHED.
3. PVC PIPE: CLASS 200, SDR 21, EXCEPT ONE-HALF INCH TO BE CLASS 315, SDR 13.5, UNDER PAVED SURFACES AND IN SLEEVES TO BE SCHEDULE 40.
4. FLEXIBLE PVC PIPE: HEAVY DUTY FLEXIBLE VINYL PIPE AS MANUFACTURED BY AGRICULTURAL PRODUCTS, INC.
5. SLEEVES: CLASS 200, SDR 21.

2.2 COPPER TUBING AND FITTINGS

A. HAND STRAIGHT LENGTHS OF DOMESTIC MANUFACTURE, TYPE "M." DO NOT USE FOREIGN EXTRUSION OR IRRIGATION TUBING.

B. COPPER TUBE FITTINGS: CAST BRONZE OR WROUGHT COPPER OR SWEAT-SOLDER TYPE. C. USE ONLY 60-40 "NO LEAD" SOLDER ON COPPER JOINTS.

2.3 VALVE WIRING

A. TYPE UF, NO. 14 GAUGE WITH 4/64" INSULATION, UNDERWRITERS LABORATORY APPROVED FOR DIRECT UNDERGROUND BURIAL WHEN USED IN NATIONAL ELECTRICAL CODE, CLASS II CIRCUIT (30-VOLTS AC OR LESS) AND SIZED NOT LESS THAN SPECIFIED BY MANUFACTURER. COLOR CODE WIRE RED FOR LEAD WIRE AND WHITE FOR COMMON WIRE.

2.4 WIRE SPLICES

A. "DRI-SPLICE" AS MANUFACTURED BY SPEARS MANUFACTURING COMPANY, "DBY CONNECTORS" AS MANUFACTURED BY 3-M COMPANY OR "ONE STEP" AS MANUFACTURED BY KING TECHNOLOGY, INC.

2.5 SOLVENT, CLEANER, AND PRIMER

A. CONFORM TO ASTM D2564.

B. PVC PIPE AND FITTINGS: WELD-ON #705 SOLVENT AND #P-70 PRIMER.

C. FLEXIBLE PVC PIPE TO SCHEDULE 40 FITTINGS: WELD-ON #795 SOLVENT AND #P-70 PRIMER.

2.6 QUICK COUPLER VALVES

A. SHALL BE 3/4" BRONZE BODIED VALVES WITH A RUBBER SEAT AND PLATED COVER. KEYS SHALL BE BRONZE CONSTRUCTED WITH 3/4" FIP X 3/4" MIP THREADED. RAINBIRD #3RC AND #33K.

2.7 SWING JOINTS

A. ONE (1") INCH UNITIZED "FULL CIRCLE" TYPE LASCO #G111-212. USE TEFLON TAPE ON ALL THREADED JOINTS AND DRAW JOINTS UP SNUGLY, DO NOT OVERTIGHTEN.

2.8 SPRAY HEAD

A. GRASS SPRAY HEADS: ABS BODY WITH A 3-1/2" SPRING LOADED POP-UP NOZZLE ASSEMBLY AND 1/2" FIP CONNECTION IN BASE. RAINBIRD OR EQUAL.

B. HIGH-POP SPRAY HEADS: ABS BODY WITH A 12" SPRING LOADED POP-UP NOZZLE ASSEMBLY AND 1/2" FIP CONNECTION IN BASE. RAINBIRD OR EQUAL.

C. NOZZLES: MATCHED PRECIPITATION RATES PLASTIC. RAINBIRD OR EQUAL.

2.9 ELECTRIC VALVES

A. NORMALLY CLOSED, GLOBE-TYPE DIAPHRAGM, GLASS-FILLED NYLON BODY AND COVER, AND BUNA N REINFORCED DIAPHRAGM WITH 24-VOLT, 1/4-AMP SOLENOID IN A WATERPROOFED HOUSING. RAINBIRD OR EQUAL.

2.10 REINFORCEMENT STAKES

A. ONE (1") INCH GALVANIZED PIPE LONG ENOUGH TO PENETRATE AT LEAST 36" INTO UNDISTURBED EARTH. USE TWO STAINLESS STEEL WORM GEAR CLAMPS WITH STAINLESS STEEL SCREWS TO FASTEN THE STATE TO THE QUICK COUPLER.

2.11 BACKFLOW PREVENTER

A. DOUBLE CHECK ASSEMBLY CONSISTING OF TWO INDEPENDENTLY OPERATING CHECK VALVES WITH AN INLET AND OUTLET SHUTOFF VALVE AND FOUR TEST COCKS. EACH CHECK VALVE SHALL BE A "Y" PATTERN, SPRING LOADED, POPPET TYPE. FEBCO #805Y.

2.12 VALVE BOXES

A. NON CORROSIVE, HEAVY DUTY, SUPERFLENAN PLASTIC MATERIAL WITH COVERS IMPREGNATED WITH COLORFAST GREEN PIGMENT. 2.13 VALVE BOX BACKFILL CLEAN, WASHED GRAVEL GRADED FROM 1/2" TO 1" DIAMETER.

2.14 ELECTRIC CONTROLLER

A. FABRICATED SO INTERNAL PARTS ARE ACCESSIBLE THROUGH CONTROLLER DOOR, ELECTRICAL COMPONENTS MOUNTED ON PRINTED CIRCUIT BOARDS WITH EDGE CONNECTOR AND PLUGS FOR EASY REMOVAL DURING MAINTENANCE.

B. HOUSING: INTERIOR 18 GAUGE WALL MOUNTABLE OR EXTERIOR 16 GAUGE WEATHERPROOFED WALL OR PEDESTAL MOUNTABLE LOCKING CASE AS INDICATED OR AS SELECTED.

C. ELECTRICAL CHARACTERSTICS: CAPABLE OF OPERATING 24 VAC ELECTRIC CONTROL VALVES INPUT POWER OF 117 VAC, 50/60 HZ THROUGH RESETTABLE CIRCUIT BREAKER TO PROTECT CONTROLLER FROM POWER OVERLOAD AND FIELD WIRING SHORT CIRCUITS.

D. LIMITS OF OPERATING TIME PER STATION: 1 MINUTE TO 9 HOURS, 59 MINUTES IN 1 MINUTE INCREMENTS.

E. NUMBER OF INDEPENDENT PROGRAMS: 3

F. NUMBER OF AUTOMATIC STARTS PER DAY PER PROGRAM: 4

G. STATION ASSIGNABILITY: EVERY COMBINATION OF PROGRAMS

H. PROGRAM SETABILITY: ON EITHER 7 DAY WEEKLY REPEAT CYCLE OR ON 1 TO 6 SKIP DAY BASIS

I. METHOD OF INDICATING PROGRAM IN OPERATION DURING OPERATION: READOUT

J. AUTOMATIC PROGRAM OVERLAP PROTECTION: CAPABLE OF ALLOWING ONLY ONE PROGRAM TO RUN AT ONE TIME AND ENSURING BY DELAYING START TIMES THAT PROGRAMMED WATERING CYCLES WILL OCCUR EVEN WHEN CYCLES ARE SCHEDULED TO START WHILE IN CONFLICT WITH EACH OTHER.

K. MANUAL OPERATION: CAPABLE OF OPERATION WITHOUT AFFECTING ORIGINAL PROGRAMS, OF BEING ACTIVATED FOR 1 MINUTE TO 9 HOURS, 59 MINUTES IN 1 MINUTE INCREMENTS, OF ACTIVATING USER DEFINED PROGRAMS AND OF ACTIVATING SYSTEMS CHECK FEATURE TO RUN EACH STATION FOR 1 MINUTE, 45 SECONDS.

L. STANDBY OPERATION: PRESET BACK-UP PROGRAM CAPABLE OF MAINTAINING USER PROGRAM DURING POWER

M. SELF-TEST FEATURE: BUILT-IN, CAPABLE OF CHECKING

1. LED'S FOR LIGHTING AND SHORTS
2. DIGITAL DISPLAY FOR LIGHTING AND SHORTS
3. EACH KEY OF KEYBOARD FOR INTEGRITY AND PROPER FUNCTION.
4. STATION OUTPUTS.

2.15 TEMPERATURE SENSOR

A. JOHNSON CONTROLS FREEZE SENSOR. PENN #A19ANC-1.

2.16 RAIN SENSOR

A. RAINBIRD OR EQUAL.

PART 3 EXECUTION

3.1 EXAMINATION

A. EXAMINE AREAS AND CONDITIONS UNDER WHICH SYSTEM IS TO BE INSTALLED.

B. NOTIFY DESIGNER IN WRITING OF CONDITIONS DETRIMENTAL TO PROPER AND TIMELY COMPLETION OF WORK.

C. DO NOT PROCEED UNTIL CONDITIONS ARE ACCEPTABLE

3.2 PREPARATION

A. COORDINATE WORK WHICH IS EMBEDDED IN CONCRETE OR MASONRY AND ROUTE UNDER PAVED AREAS.

B. PROVIDE TIMELY DELIVERY AND INSTALLATION AT JOB SITE.

C. PROTECT ADJACENT STRUCTURES, SURFACES, AND FINISHES. DO NOT MOVE EQUIPMENT OVER STRUCTURES WITHOUT WRITTEN APPROVAL FROM DESIGNER. PROVIDE NECESSARY PROTECTION SUCH AS BOARD ROADING, DROP CLOTHS, ETC., AS REQUIRED.

3.3 INSTALLATION

A. GENERAL:

1. STAKING: BEFORE INSTALLATION IS STARTED, PLACE A STAKE WHERE EACH SPRINKLER IS TO BE LOCATED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS. RECEIVE WRITTEN APPROVAL FROM DESIGNER BEFORE PROCEEDING.
2. EXCAVATION: IS UNCLASSIFIED AND INCLUDES EARTH, LOOSE ROCK, ROCK OR ANY COMBINATION THEREOF, IN WET OR DRY STATE. CONTRACTOR SHALL REVIEW GEOTECHNICAL REPORT AND GRADING PLANS AND INCLUDE ANY COST FOR ROCK REMOVAL IN BID. NO ADDITIONAL COST FOR ROCK EXCAVATION WILL BE ACCEPTED.
3. BACKFILL: USE MATERIAL EXCAVATED EXCEPT WHERE PIPE MANUFACTURER'S SPECIFICATIONS REQUIRE OTHERWISE. USE SELECT FILL DIRT OR SAND IF EXISTING SOIL IS ROCKY OR CONTAINS LARGE CLODS. HAND-TAMP AND WATER-JET TO PREVENT AFTER SETTLING. HAND-RAKE TRENCHES AND ADJOINING AREAS TO LEAVE GRADE IN AS GOOD OR BETTER CONDITION AS PRIOR TO BEGINNING INSTALLATION.
4. PIPE LAYOUT: ROUTE AROUND TREES AND SHRUBS TO AVOID DAMAGE TO ROOT SYSTEM. DO NOT DIG WITHIN ROOT BALLS OF NEWLY PLANTED TREES OR SHRUBS. DO NOT MOVE OR DAMAGE TREES AND SHRUBS.

B. PIPE INSTALLATION:

1. SPRINKLER MAIN: INSTALL IN 4-INCH WIDE (MINIMUM) TRENCH WITH A MINIMUM OF 18 INCHES OF COVER.
2. LATERAL PIPING: INSTALL IN 4-INCH WIDE (MINIMUM) TRENCH WITH A MINIMUM OF 12-INCHES OF COVER.
3. TRENCHING: REMOVE LUMBER, RUBBISH AND GREATER THAN 1-1/2 INCHES IN DIAMETER FROM TRENCHES. PROVIDE A FIRM, UNIFORM BEARING FOR ENTIRE LENGTH OF PIPE TO PREVENT UNEVEN SETTLEMENT. PAD TRENCHES WITH DIRT OR SAND IF SOIL IS ROCKY. DO NOT WEDGE OR BLOCK PIPE. SNAKE PIPE FROM SIDE TO SIDE OF TRENCH BOTTOM TO ALLOW FOR EXPANSION AND CONTRACTION. REMOVE FOREIGN MATTER OR DIRT FROM INSIDE OF PIPE PRIOR TO WELDING AND KEEP CLEAN DURING AND AFTER INSTALLATION. DO NOT LAY PIPING IN TRENCHES WHEN WATER IS IN THE TRENCH, WHEN TEMPERATURE IS 36 DEGREES OR BELOW OR WHEN RAINS ARE EMINENT.

C. PVC PIPE AND FITTING ASSEMBLY:

1. SOLVENT: USE TYPE AND PROCEDURES RECOMMENDED BY PIPE MANUFACTURER TO MAKE SOLVENT-WELDED JOINTS. THOROUGHLY CLEAN PIPE AND FITTING OF DIRT, DUST, AND MOISTURE BEFORE APPLYING SOLVENT.
2. PVC TO METAL CONNECTION: WORK METAL CONNECTION FIRST. USE A NON-HARDENING PIPE DOPE SUCH AS PERMATEX NO. 2 ON THREADED PVC TO METAL JOINTS. USE ONLY LIGHT WRENCH PRESSURE.
3. THREADED PVC CONNECTION: WHERE REQUIRED, USE THREADED PVC ADAPTERS INTO WHICH PIPE MAY BE WELDED.

D. COPPER TUBING AND FITTING ASSEMBLY:

1. CLEAN PIPE AND FITTING THOROUGHLY AND BUFF CONNECTION WITH SAND PAPER TO REMOVE RESIDUE FROM PIPE.
2. FLUX PIPE AND FITTING, SOLDER CONNECTION USING 60-40 SOFT SOLID CORE LEAK-FREE SOLDER.

E. SPRINKLERS

1. GENERAL: SUPPLY IN ACCORDANCE WITH EQUIPMENT LIST AND SIZE SHOWN ON APPROVED SHOP DRAWINGS. REVISE NOZZLE DEGREE AND TRAJECTORY AS REQUIRED BY WIND CONDITION AS AFFECTING COVERAGE. FIRMLY TAMP GRADE AROUND HEAD.
2. LAWN SPRAY HEAD: INSTALL WITH TOP SIDE OF HEAD FLUSH TO ONE-QUARTER (1/4") INCH ABOVE FINISH GRADE AND 4" MINIMUM FROM BACK OF CURB. ATTACH TO LATERAL PIPING WITH A FLEXIBLE 1/2" X 12" PVC FLEXIBLE RISER. NO POLYETHYLENE NIPPLES WILL BE ALLOWED.
3. HIGH-POP SPRAY HEAD: INSTALL WITH UNDERSIDE OF FLANGE FLUSH WITH FINISH GRADE AND 4" MINIMUM FROM BACK OF CURB. ATTACH TO LATERAL PIPING WITH A FLEXIBLE 1/2" X 12" PVC FLEXIBLE RISER.
4. ROTARY HEAD: INSTALL WITH UNDERSIDE OF FLANGE FLUSH WITH FINISH GRADE AND 4" MINIMUM FROM BACK OF CURB. ATTACH TO LATERAL PIPING WITH A SWING JOINT AS DETAILED ON DRAWINGS.
5. BUBBLERS: INSTALL WITH FLANGE FLUSH WITH FINISH GRADE. ATTACH TO PIPING PER MANUFACTURER'S SPECIFICATIONS.

F. QUICK COUPLER VALVE

1. INSTALL FLUSH WITH FINISH GRADE. ATTACH TO SPRINKLER MAINS WITH SWING JOINT AS DETAILED ON DRAWINGS. INSTALL REINFORCEMENT STAKE PERPENDICULAR TO GRADE AND BURIED BELOW FINISH GRADE TWO (2") INCHES MINIMUM. ATTACH TO VALVE WITH CLAMPS AS DETAILED.

G. ELECTRIC REMOTE CONTROL VALVE

1. SUPPLY IN ACCORDANCE WITH EQUIPMENT LIST AND SIZE SHOWN ON APPROVED SHOP DRAWINGS.
2. INSTALL IN A LEVEL POSITION DEEP ENOUGH SO THERE WILL BE AT LEAST 12 INCHES OF COVER OVER VALVES AND IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. INSTALL A 10-INCH GREEN PLASTIC VALVE BOX.

H. WIRING

1. SUPPLY WIRE FROM AUTOMATIC SPRINKLER CONTROLLER TO VALVES IN ACCORDANCE TO CONTROLLER MANUFACTURER'S SPECIFICATIONS. A SEPARATE WIRE IS REQUIRED FROM CONTROLLER TO EACH VALVE. PROVIDE A COMMON NEUTRAL WIRE WITH WHITE INSULATION FROM CONTROLLER TO EACH VALVE.
2. LAY WIRE IN TRENCHES PROVIDED FOR PIPING UNDER THE PIPING TAPING IN BUNDLES EVERY TEN (10') FEET WITH PLASTIC ELECTRIC TAPE.
3. NO CONDUIT IS REQUIRED FOR WIRE EXCEPT UNDER PAVED AREAS.
4. JOIN WIRES TOGETHER USING WATER-PROOF SPLICE KITS.
5. PROVIDE 48" EXPANSION COIL OF VALVE AND GROUND WIRE AT EACH REMOTE CONTROL VALVE AND SPLICE. FORM EXPANSION COIL BY WRAPPING FIRMLY AND EVENLY AROUND A PIECE OF ONE (1") INCH PVC PIPE.
6. CONNECT VALVE WIRE TO BOTH SENSORS IN "SERIES" SO EITHER SENSOR CAN "OPEN" THE "CIRCUIT" AND SHUT SYSTEM DOWN.

I. AUTOMATIC IRRIGATION CONTROLLER

1. INSTALL ACCORDING TO MANUFACTURER'S RECOMMENDATION AT LOCATION APPROVED BY OWNER. ALL ABOVE-GROUND WIRING SHALL BE IN CONDUIT CONFORMING TO NATIONAL ELECTRIC CODE REQUIREMENTS.
2. PROGRAM CONTROLLER SYSTEM SETTING OPERATING TIMES AND DURATION AS DIRECTED BY BY OWNER'S REPRESENTATIVE AND ADJUST AS REQUIRED.

J. TEMPERATURE AND RAIN SENSORS: INSTALL IN LOCATIONS APPROVED BY OWNER'S REPRESENTATIVE.

3.4 TESTING

A. GENERAL: PERFORM REQUIRED TESTING UNDER OBSERVATION OF DESIGNER. GIVE 7 DAY NOTICE THAT TESTS ARE TO BE CONDUCTED.

B. SPRINKLER MAIN: TEST FOR A PERIOD OF 12 TO 14 HOURS UNDER NORMAL WATER PRESSURE. IF LEAKS OCCUR, CORRECT DEFECT AND REPEAT TEST.

C. LATERAL PIPING: TEST FOR A PERIOD OF 1 HOUR UNDER NORMAL WATER PRESSURE. IF LEAKS OCCUR, CORRECT DEFECT AND REPEAT TEST.

D. COMPLETE TESTING PRIOR TO BACKFILLING. SUFFICIENT BACKFILL MAY BE PLACED IN TRENCHES BETWEEN FITTINGS TO INSURE STABILITY OF LINE UNDER PRESSURE. IN EACH CASE, LEAVE FITTINGS AND COUPLINGS OPEN TO VISUAL INSPECTION FOR FULL PERIOD OF TEST.

E. VERIFY SENSOR OPERATION TO SHUT SYSTEM DOWN BY FILLING RAIN SENSOR WITH 1/4" OF WATER AND THEN PLACING TEMPERATURE SENSOR IN ICE.

3.5 FINAL ADJUSTMENT

A. AFTER SYSTEM HAS BEEN INSTALLED, MAKE FINAL ADJUSTMENTS PRIOR TO INSPECTION BY ENGINEER.

B. COMPLETELY FLUSH SYSTEM TO REMOVE DEBRIS FROM LINES BY REMOVING NOZZLES FROM HEADS AND TURNING ON SYSTEM. REPLACE NOZZLES AND CHECK OPERATION OF SYSTEM, SECTION BY SECTION, TO DETERMINE THAT THERE IS NO DEBRIS LEFT IN THE HEADS TO OBSTRUCT PROPER OPERATION. IF ANY HEADS DO NOT OPERATE PROPERLY, REPEAT OPERATION BY REMOVING NOZZLES OF HEADS NOT OPERATING PROPERLY AND REFLUSHING.

C. CHECK SPRINKLERS FOR PROPER OPERATION AND PROPER ALIGNMENT FOR DIRECTION OF THROW.

D. CHECK EACH SECTION OF HEADS FOR OPERATING PRESSURE AND BALANCE TO OTHER SECTIONS BY USE OF FLOW ADJUSTMENT ON TOP OF EACH VALVE.

E. CHECK NOZZLING FOR PROPER COVERAGE. PREVAILING WIND CONDITIONS OR SLOPES MAY INDICATE THAT ARC OF ANGLE OR TRAJECTORY OF SPRAY SHOULD BE MODIFIED, CHANGE NOZZLES TO PROVIDE CORRECT COVERAGE.

F. AFTER SYSTEM IS THOROUGHLY FLUSHED AND READY FOR OPERATION, EACH SECTION OF SPRINKLERS MUST BE ADJUSTED TO CONTROL PRESSURE AT HEADS. USE THE FOLLOWING METHOD, ONE SECTION AT A TIME:

1. REMOVE LAST HEAD ON SECTION AND INSTALL TEMPORARY RISER ABOVE GRADE. INSTALL TEE WITH PRESSURE GAUGE ATTACHED ON TOP OF RISER AND REINSTALL HEAD WITH NIPPLE ONTO TEE.
2. CORRECT OPERATING PRESSURE RANGE AT LAST HEAD OF EACH SECTION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
3. AFTER REPLACING HEADS, AT GRADE, TAMP THOROUGHLY AROUND HEAD.

3.06 CLEANUP

A. DURING WORK, KEEP PREMISES NEAT AND ORDERLY. REMOVE TRASH AND DEBRIS FROM SITE DAILY AS WORK PROGRESSES. AFTER COMPLETION OF WORK LEVEL AND RAKE CLEAN DISTURBED AREAS, LEAVING IN AN ORDERLY CONDITION ACCEPTABLE TO DESIGNER.

END OF LANDSCAPE IRRIGATION SECTION

$$$$SYSTIME$$$$
$$$$ORIGIN$$$$
$$$$USERNAME$$$$

NCDOT - Division 3 - Roadside
Environmental Unit
803 Penderlea Highway Burgaw, NC 28425
Ph: 910-259-4919 Fax: 910-259-2781
Contact: Joe Chance

Landscape Enhancement Projects
Jacksonville, North Carolina
Onsler County

contract #:

sheet description:

prel. design date : April/2013

checked by & date :

final design date :

General Irrigation Specifications

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

T.I.P. #

WBS #

FED I.D. #

sheet no : L6

total sheet no : 6