OWNER TYPICAL DETAILS

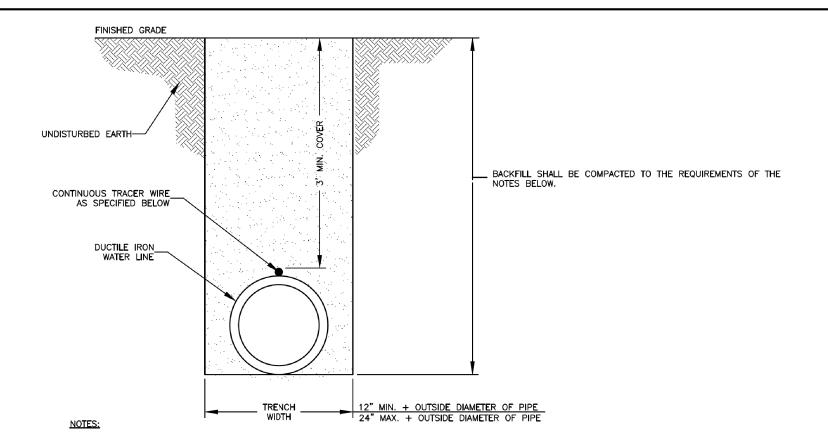
SEE DETAILS FOR TYPICAL PAVEMENT REPLACEMENT SECTIONS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. SHEET NO. U-5840 UC-3D ESIGNED BY: CTH CTH RAWN BY: ASV HECKED BY: APPROVED BY: XMD SEAL 025221 REVISED: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC PHONE: (919)707-6690 UTILITY CONSTRUCTIO FAX: (919)250-4151

UTILITY CONSTRUCTION



TRENCHES EXCAVATED OUTSIDE EXISTING ROAD AND RAILWAY RIGHTS-OF-WAY SHALL BE BE BACKFILLED WITH COMMON BACKFILL MATERIAL CONSISTING OF EXCAVATED MATERIALS EXCEPT HIGHLY ORGANIC SILTS AND CLAYS AND TAMPED THOROUGHLY. FILL SHALL BE DEPOSITED IN SUCCESSIVE, UNIFORM, APPROXIMATELY HORIZONTAL LAYERS. MATERIAL SHALL BE FREE OF ROOTS, STONES, AND DEBRIS. ALL MATERIAL SHALL HAVE AN IN-PLACE DENSITY OF AT LEAST 85% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR) OR AS APPROVED BY THE ENGINEER. COMMON BACKFILL SHALL NOT CONTAIN STONE BLOCKS, BROKEN CONCRETE, MASONRY RUBBLE, OR OTHER SIMILAR MATERIALS. IT SHALL HAVE PHYSICAL PROPERTIES SUCH THAT IT CAN BE READILY SPREAD AND COMPACTED DURING FILLING. SNOW, ICE, AND FROZEN SOIL WILL NOT BE PERMITTED.

WHERE EXCAVATED MATERIAL, AFTER REMOVAL OF ROCKS, STUMPS, PLANT MATERIAL, AND OTHER EXTRANEOUS MATERIAL AND PROPER DEWATERING, DRYING, WHERE EXCAVAILED MATERIAL, AFTER REMOVAL OF ROCKS, STOMPS, PLANT MATERIAL, AND OTHER EXTRANEOUS MATERIAL AND PROPER DEWATERING, DRYING, PROTECTION, AND STORAGE OF THE EXCAVATION BY THE CONTRACTOR, CANNOT BE PREPARED TO MEET THE REQUIREMENTS FOR COMMON BACKFILL, DUE TO THE NATURE OF THE MATERIAL (E.G., EXCESSIVE ROCK, MUCK, ORGANICS, CLAY, SILT, OR OTHER MATERIAL), AND AS DETERMINED BY THE ENGINEER, THE UNACCEPTABLE EXCAVATION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR AND REPLACED BY IMPORTED BACKFILL MEETING THE REQUIREMENTS OF STRUCTURAL BACKFILL. IMPORTED STRUCTURAL BACKFILL SHALL BE FREE OF ORGANICS, ROOTS OR OTHER DELETERIOUS MATERIALS AND SHALL NOT CONTAIN MORE THAN FIVE PERCENT (BY WEIGHT) ORGANIC MATERIAL, HAVE A PLASTICITY INDEX (PI) GREATER THAN 25, OR HAVE A MAXIMUM DRY DENSITY LESS THAN 90 POUNDS PER CUBIC FOOT. IMPORTED STRUCTURAL FILL SHOULD CONSIST OF MATERIAL CLASSIFIED AS ML, CLASSIFIED AS ML, OR RETTER PER ASTM DE 2487 AND BE CAPABLE OF BEING COMPACTED TO 85% STANDARD PROCTOR CL, SC, OR SM, OR BETTER PER ASTM D-2487 AND BE CAPABLE OF BEING COMPACTED TO 85% STANDARD PROCTOR.

2. THE WATER LINE SHALL HAVE A MINIMUM OF 3' OF COVER AT FINISHED GRADE.

TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPRISED OF HIGH-TENACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL. BLUE HDPE JACKET PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE AND CONNECTORS SHALL BE TRACE—SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC., OR EQUIVALENT APPROVED BY ENGINEER, AND PRODUCED IN THE UNITED

TRACER WIRE SHALL BE EXTENDED ALONG ALL WATER LINES, FITTINGS, VALVES, SERVICES, AND HYDRANTS. LOCATING CLIPS SHALL BE PROVIDED AT ALL VALVES, HYDRANT VALVES AND METER BOXES. THE CONTRACTOR SHALL DUCT TAPE TRACER WIRE ON CROWN OF WATER LINE EVERY FIVE FEET.

WATER TRENCH CONSTRUCTION OUTSIDE PAVEMENT NOT TO SCALE \WD-1/

- 1. WATER CONSTRUCTION ON THIS SITE IS AUTHORIZED BY PERMITS ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ) AND THE CITY OF AT ALL TIMES BY REPRESENTATIVES OF NCDEQ. THE CITY OF PERMITS REQUIRE CERTIFICATION OF COMPLETION OF THE WATER SYSTEMS BY THE ENGINEER PRIOR TO ISSUANCE OF
- FINAL OPERATION APPROVAL 2. CONTRACTOR SHALL NOTIFY NC811 & APPROPRIATE UTILITIES AGENCIES PRIOR TO PERFORMING ANY WORK.
- CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND THE ELEVATION FOR ALL UTILITIES, DRAINAGE AND OTHER UNDERGROUND FACILITIES BOTH EXISTING AND PROPOSED AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO CONSTRUCTION.
- 4. CONTRACTOR SHALL PROTECT EXISTING UTILITIES DURING WITH APPLICABLE STANDARDS OF APPROPRIATE AGENCIES AT THE CONTRACTOR'S EXPENSE.
- 5. THE CONTRACTOR SHALL CO-OPERATE AT ALL TIMES WITH THE UTILITY OWNERS TO MAINTAIN THE OPERATION OF EXISTING UTILITIES WITH THE LEAST AMOUNT OF INTERFERENCE AND INTERRUPTION POSSIBLE CONTINUOUS SERVICE, PUBLIC HEALTH AND SAFETY CONSIDERATIONS SHALL EXCEED ALL OTHERS AND CONTRACTOR'S SCHEDULE, PLANS AND WORK SHALL AT ALL TIMES BE SUBJECT TO ALTERATION AND REVISION IF NECESSARY FOR THESE CONSIDERATIONS. 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE
- TEMPORARY OR PERMANENT RELOCATION OF STRUCTURES AND UTILITIES, INCLUDING BUT NOT LIMITED TO POLES, SIGNS, FENCES. HYDRANTS. VALVES PIPING. CONDUITS AND DRAINS THAT INTERFERE WITH THE POSITIONING OF THE WORK AS SHOWN ON THE DRAWINGS.
- 7. AT A MINIMUM, ALL PIPES & FITTINGS 12 INCHES OR LESS THAN 12 INCHES RATED CLASS 250 PSI.
- TUBING PER ASTM B88. THE LONGEST AVAILABLE LENGTH OF
- SERVICE LINE SHOULD BE USED WITH NO UNIONS. 9. PROVIDE ROCK CHECK DAMS IN ALL DITCH LINES WHERE DISTURBANCE OCCURS.

WD-1 NOT TO SCALE

WATER DETAILS GENERAL NOTES

- IN DIRT, GRASS AND LANDSCAPED AREAS FILL MATERIAL MUST BE REPLACED IN TRENCH TO GRADE AS SOON AS WATERLINE CONSTRUCTION ALLOWS, ADEQUATE SEEDING AND STRAW OR MULCH SHALL THEN BE APPLIED TO THE
- WHEN ABANDONING EXISTING METERS AND HYDRANTS, RESTORE AREAS TO SURROUNDING CONDITIONS. WHEN ABANDONING VALVES, REMOVE BOX, BACK FILL WITH
- DIRT, STONE OR FLOWABLE FILL. COVER TO MATCH INSTALL FERROUS PIPING FOR BOTH WATER AND SEWER WITHIN 10 FT. OF A CROSSING IF:
- 13.1. SEWER LINE CROSSES OVER WATER, OR 13.2. VERTICAL CLEARANCE BETWEEN WATER AND SEWER IS LESS
- 13.3. MAINTAIN 10 FEET HORIZONTAL SEPARATION BETWEEN SEWER AND WATER MAINS UNLESS LAID IN SEPARATE TRENCHES WITH THE BOTTOM OF THE WATER LINE AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER LINE OR USE FERROUS MATERIAL FOR BOTH WATER AND SEWER. MAINTAIN 12 INCHES VERTICAL SEPARATION BETWEEN STORM
- DRAIN AND WATER, OR INSTALL FERROUS MATERIAL WATER LINE WITHIN 10 FEET EACH SIDE OF CROSSING. 15. THE CITY OF HENDERSONVILLE MUST BE NOTIFIED AT LEAST 72 HOURS PRIOR TO TAPPING OF CITY WATER LINES. THE CITY WILL PERFORM ALL TAPS FOUAL TO OR GREATER THAN 6 INCHES. IN ADDITION, THE CONTRACTOR OR DEVELOPER MAY REQUEST THAT THE CITY PERFORM TAPS LESS THAN 6 INCHES, PROVIDED THAT THE CITY BE GIVEN NOTICE 72 HOURS IN ADVANCE.
- EXACT LOCATIONS OF VAULTS, METERS, BACKFLOW PREVENTION DEVICES AND SERVICE LINES, MUST BE APPROVED BY THE CITY OF HENDERSONVILLE. ALL WATER METERS WILL BE SET BY CITY OF

04/04/18<u>/î.</u>

- IS GRANTED WRITTEN PERMISSION BY THE COH CITY 17.1. THE CONTRACTOR WILL PROVIDE THE CITY NOTICE OF 10 WORKING DAYS PRIOR TO THE DATE OF METER
- INSTALLATION. 17.2. THE CONTRACTOR WILL PROVIDE A LICENSED

HENDERSONVILLE STAFF UNLESS THE CONTRACTOR/ENGINEER

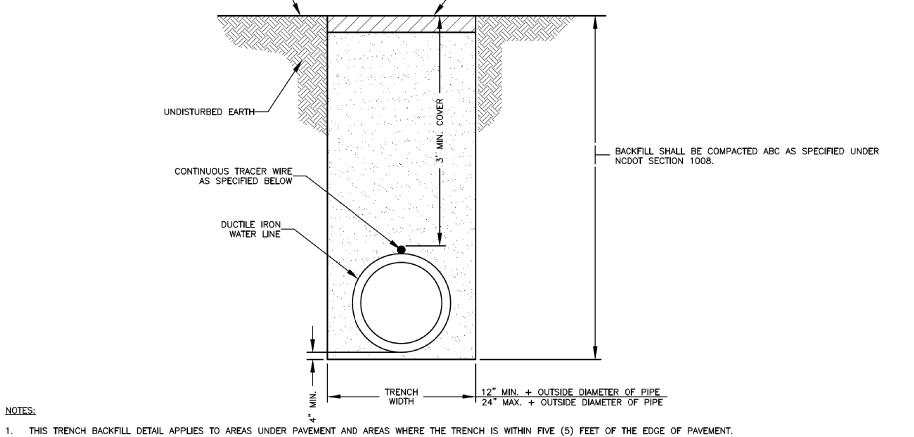
LINE SERVICES IN ALL MULTI-METER BOXES. 18. MATERIALS AND INSTALLATION FOR WATER LINES SHALL CONFORM TO THE CITY OF HENDERSONVILLE STANDARD AND 19. ALL CONSTRUCTION SHALL BE INSTALLED BY A NORTH CAROLINA LICENSED UTILITY CONTRACTOR. ALL WATER APPURTENANCES ARE TO BE MADE USING LEAD

FREE MATERIALS. ALL CAST IRON COMPONENTS SHALL BE

- 21. ALL WATER MAINS SHALL HAVE 3 FEET MINIMUM COVER. RESTRAINED JOINTS BY AN APPROVED PIPE MANUFACTURER ARE TO BE USED FOR ALL PUBLIC WATER LINES WHERE THRUST RESTRAINING IS REQUIRED. HOWEVER, THRUST
- EXISTING WATER LINES OR WHERE THE USE OF MECHANICAL RESTRAINT IS NOT FEASIBLE. 23. ALL FIRE HYDRANTS, VAULTS, BACKFLOW PREVENTERS, HOT BOXES AND WATER METERS ARE TO BE INSTALLED ON
- RELATIVELY FLAT AREAS OUTSIDE OF PAVEMENT. 24. ALL PLANS SHALL INCLUDE NOTES AND DETAILS. REVIEWED AND APPROVED BY THE CITY, FOR PROPOSED WATER SOURCING DURING CONSTRUCTION.
- 25. TAMPERING WITH THE PUBLIC WATER SUPPLY WILL RESULT IN LOCKING OUT OF THE WATER SERVICES. INCLUDING DOMESTIC AND COMMERCIAL, UNTIL FINAL APPROVAL BY THE CITY OF HENDERSONVILLE.

TESTING & INSPECTION:

- NOTIFY THE CITY OF HENDERSONVILLE AND ENGINEER AT LEAST 72 HOURS BEFORE STARTING CONSTRUCTION OF WATER FACILITIES. THE ENGINEER SHALL PERIODICALLY INSPECT THE PROGRESS OF INSTALLATION AND SHALL COMPLETE A FINAL WATER AND SEWER INSPECTION. THE CONTRACTOR SHALL FURNISH SECURE AND PROVIDE ALL NECESSARY TESTING MATERIALS, EQUIPMENT, PROCEDURE AND CERTIFIED LABORATORY TEST RESULTS FOR USE WITH ENGINEERS FINAL CERTIFICATION OF COMPLETION.
- PRESSURE TEST WATER MAINS TO 200 PSI MIN. AND 250 MAX AS PER CITY OF HENDERSONVILLE REQUIREMENTS. FIRE SYSTEMS SHALL BE REVIEWED BY THE APPROPRIATE LOCAL PERMITTING AUTHORITY: CITY OF HENDERSONVILLE FIR MARSHALL'S OFFICE OR HENDERSON COUNTY FIRE MARSHALL'S OFFICE, IN ACCORDANCE WITH APPROPRIATE LOCAL, STATE,
- ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE USC APPROVED AND REVIEWED BY THE CITY OF HENDERSONVILLE'S ENVIRONMENTAL SERVICES COORDINATOR. PROTECTION OF THE PUBLIC WATER DISTRIBUTION SYSTEM SHALL BE ASSURED BY INSPECTION OF THE INSTALLATION AND TESTING OF BACKFLOW STATE, AND FEDERAL REGULATIONS.



- 2. COMPACTION OF THE BACKFILL SHALL BE ACHIEVED THROUGH THE USE OF AN APPROVED VIBRATORY PLATE TAMPER OR ROLLER.
- 3. COMPACTION TESTING OF THE BACKFILL SHALL BE PROVIDED, DIRECTED AND COORDINATED BY THE OWNER. INTERVALS OF TESTING SHALL BE AT THE TOTAL DISCRETION OF THE OWNER AND MAY BE CHANGED AT ANY TIME. IF A TEST DOES NOT PASS, THE CONTRACTOR SHALL REMOVE THE DEFECTIVE BACKFILL, REDO THE WORK AND THE AREA WILL BE RETESTED. THE CONTRACTOR SHALL BE AWARE OF THE LEVEL OF COMPACTION REQUIRED.

THE WATER CONTENT OF THE BACKFILL MATERIAL SHALL ALSO BE TESTED AND RECORDED FOR EACH TEST COMPLETED. THE CONTRACTOR WILL BE ALLOWED TO ADD WATER TO THE BACKFILL MATERIAL IN ORDER TO OBTAIN THE OPTIMUM WATER CONTENT. HOWEVER, THE CONTRACTOR WILL NOT BE ALLOWED TO UTILIZE THE ADDITION OF WATER AS A MEANS OF COMPACTION. FURTHERMORE, SHOULD THE BACKFILL MATERIAL BE FOUND TO HAVE WATER CONTENT RATIOS WHICH IN THE OPINION OF THE ENGINEER OR THE OWNER PREVENTS THE APPROPRIATE COMPACTION OF THE TRENCH, THE CONTRACTOR SHALL REMOVE ALL DEFECTIVE MATERIAL AND UNDERTAKE THE NECESSARY CORRECTIVE WORK.

- TRACER WIRE WILL BE A 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLYETHYLENE INSULATION. CORE MATERIAL COMPRISED OF HIGH-TENACITY, WOVEN POLYESTER WITH WATER BLOCKING YARNS ENCAPSULATED IN 30 MIL. BLUE HDPE JACKET PROVIDING CORROSION RESISTANCE, FLEXIBILITY, IMPACT STRENGTH AND 1800 LBS. TENSILE STRENGTH. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND IS DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH WOVEN POLYESTER FIBER CORE ARE TO BE USED. TRACER WIRE AND CONNECTORS SHALL BE TRACE—SAFE® WATER BLOCKING TRACER WIRE AND RELATED CONNECTORS, MANUFACTURED BY NEPTCO, INC., OR EQUIVALENT APPROVED BY ENGINEER, AND PRODUCED IN THE UNITED STATES OF AMERICA.

TRACER WIRE SHALL BE EXTENDED ALONG ALL WATER LINES, FITTINGS, VALVES, SERVICES, AND HYDRANTS. LOCATING CLIPS SHALL BE PROVIDED AT ALL VALVES, HYDRANT VALVES AND METER BOXES. THE CONTRACTOR SHALL DUCT TAPE TRACER WIRE ON CROWN OF WATER LINE EVERY FIVE FEET.

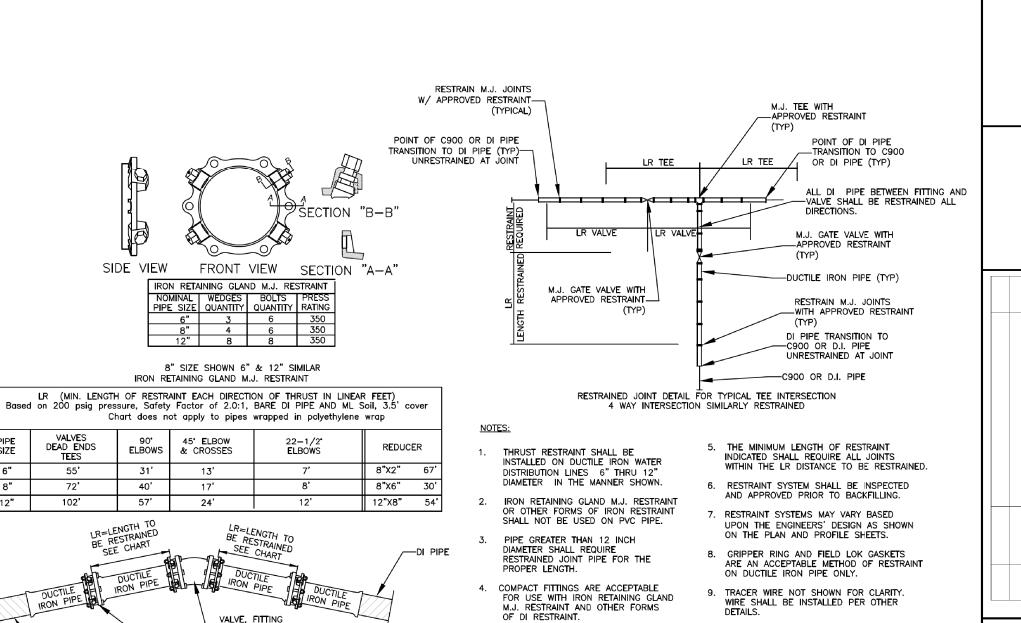
RESTRAIN MJ JOINTS WITH IRON

I.J. RESTRAINT RETAINING GLANDS (TYP) OR OTHER FORM OF APPROVED DI RESTRAINT.

WATER TRENCH CONSTRUCTION **UNDER PAVEMENT** NOT TO SCALE $\backslash \mathsf{WD} ext{-}1$

TAPS AND SERVICE LINES TO BE USED FOR CONSTRUCTION HENDERSONVILLE. CITY STAFF MUST BE NOTIFIED 72 HOURS PRIOR TO THE TAP AND LINE INSTALLATION SO THAT THEY MAY BE PRESENT. THE SERVICE LINE SHALL BE PAIRED WITH AN IRRIGATION METER AND A USC APPROVED BACKFLOW PREVENTION THIS ASSEMBLY INSTALLATION MUST BE TESTED AND

- DISINFECT WATER LINES AND PROVIDE ACCEPTABLE BACTERIOLOGICAL TEST FROM A CERTIFIED TESTING LABORATORY FOR USE WITH THE ENGINEER'S CERTIFICATION
- THE CONTRACTOR OR ENGINEER SHALL DEVELOP A SAMPLING PLAN DESCRIBING THE SPECIFIC LOCATION OF EACH SAMPLE (I.E. DISINFECTANT CONCENTRATION, BACTERIOLOGICAL) REQUIRED FOR THE PROJECT.
- THE ENGINEER SHALL APPROVE THE SAMPLING PLAN AND SUBMIT SAID PLAN TO THE CITY PRIOR TO ANY BACTERIOLOGICAL SAMPLING EVENTS. ORIGINAL CITY DIRECTLY FROM THE TESTING LABORATORY.
- THE ENGINEER SHALL NOTIFY THE CITY OF HENDERSONVILLE 72 HOURS (MINIMUM) PRIOR TO ANY LINE OR PUMP STATION TESTING OPERATIONS TO ALLOW CITY STAFF TO BE ON-SITE DURING TESTING AND DURING THE APPLICATION OF 10. SECURE FINAL OPERATION APPROVAL FROM THE CITY OF
- HENDERSONVILLE PRIOR TO ACTIVATION OF THE SYSTEM. NO WATER SERVICE WILL BE PROVIDED UNTIL WRITTEN APPROVAL OF THE SYSTEM IS ISSUED BY THE CITY OF HENDERSONVILLE TRENCH BACKFILL AND COMPACTION TESTING SHALL BE PERFORMED BY A CERTIFIED SOILS LABORATORY UNDER ALL TRENCH TO WITHIN SIX (6) INCHES OF THE SUBGRADE SHALL HAVE A MINIMUM DRY DENSITY OF 95% AS DEFINED BY THE STANDARD PROCTOR TEST. ALL MATERIAL WITHIN THE TOP 6 INCHES OF THE SUBGRADE LEVEL SHALL HAVE AN IN PLACE
- 12. THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH RED LINE DRAWING SHOWING ALL FIELD CHANGES SUITABLE FOR PREPARATION OF FINAL RECORD DRAWINGS.



0 ATE: MARCH 23, 2018

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THE STANDARD WATER DETAILS ARE FOR THE SOLE USE OF PROJECTS DIRECTLY FOR, OR THOSE PROJECTS IN WHICH OWNERSHIP WILL BE TRANSFERRED TO THE CITY OF HENDERSONVILLE. THESE TYPICALS ARE INTENDED TO SHOW THE CITY OF HENDERSONVILLE'S EXPECTATIONS FOR THE GENERAL LAYOUT, ARRANGEMENT, AND THE QUALITY OF EQUIPMENT AND MATERIALS FOR WATER DISTRIBUTION SYSTEM ITEMS AND THEIR RELATED APPURTENANCES. IT REMAINS THE SOLE RESPONSIBILITY OF THI ENGINEER IN RESPONSIBLE CHARGE (ERC) OF EACH APPLICATION TO DETERMINE, DESIGN TO, AND CERTIFY TO THE DESIGN PARAMETERS FOR EACH INSTALLATION. THE ERC MUST ALSO ENSURE THE

DESIGN COMPLIES WITH THE MINIMUM DESIGN CRITERIA OF NC DIVISION OF ENVIRONMENTAL QUALIT AND ALL LOCAL AND STATE LAWS AND REGULATIONS. H:\DETAILS\Current Standard Details\Water Only\Updated_Water_Details04-04-18.dwg, 5/3/2018 11:08:38 AM

DUCTILE IRON PIPE RESTRAINT DETAIL WD-1/

WIRE SHALL BE INSTALLED PER OTHER

10. M.J. SHALL BE PRODUCED IN USA.

RAWN BY: ROJECT NO .: