SPECIFICATIONS FOR WATER MAINS

WATERLINE SHALL BE INSTALLED, TESTED AND STERILIZED UNDER THE DIRECT SUPERVISION OF THE CITY OF OREGON DIVISION OF WATER. NO DEVIATION FROM THESE SPECIFICATIONS WILL BE PERMITTED. THE CITY OF OREGON SPECIFICATIONS FOR WATER MAINS CAN ALSO BE REFERENCED ON THE CITY OF OREGON WEBSITE AT https://www.oregonohio.org/departments/engineering/

EXCEPT AS MODIFIED BY THESE PLANS AND BY THE DETAILED SPECIFICATIONS PERTAINING THERETO, ALL WORK ON THIS PROJECT SHALL BE GOVERNED BY THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION. CONSTRUCTION AND MATERIAL SPECIFICATIONS DATED JANUARY 1, 2023 AND BY SUCH SUPPLEMENTAL STATE SPECIFICATIONS AS MAY BE IN EFFECT 14 CALENDAR DAYS PRIOR TO THE AWARD OF THIS PROJECT. IN THE AFORESAID SPECIFICATIONS, THE WORDS "STATE", "DIRECTOR", AND "ENGINEER" SHALL BE HELD TO MEAN COMMISSIONER OF WATER OR HIS REPRESENTATIVE.

THE SPECIFICATIONS OF THE AMERICAN NATIONAL STANDARDS INSTITUTE, AMERICAN WATER WORKS ASSOCIATION, AND THE AMERICAN SOCIETY OF TESTING AND MATERIALS HEREIN REFERRED TO, UNLESS OTHERWISE NOTED, SHALL BE THE LATEST SPECIFICATIONS OF THE RESPECTIVE ORGANIZATIONS.

ALL MATERIAL SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA. COPIES OF SUPPLIERS' INVOICES AND/OR CERTIFICATIONS SHALL BE SUBMITTED TO ENGINEER, AS REQUESTED.

THE MANUFACTURER SHALL FURNISH AN AFFIDAVIT INDICATING THAT THE PIPE, FITTINGS AND APPURTENANCES HAVE BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE APPLICABLE REFERENCED STANDARDS. A COPY OF THE AFFIDAVIT, INDICATING THE PROJECT ON WHICH THE MATERIAL IS TO BE USED, SHALL BE FORWARDED TO THE CITY OR THEIR ENGINEER.

SPECIAL NOTICE

THE CITY OF OREGON HAS APPROXIMATELY 26 MILES OF EXISTING PRESTRESSED REINFORCED CONCRETE TRUNK WATER MAINS THAT CIRCUMVENT THE CITY. BY THEIR VERY NATURE, EMERGENCY REPAIRS ARE EXPENSIVE AND TIME CONSUMING. THESE CONCRETE MAINS ARE LOCATED ON OR CROSS THE FOLLOWING ROADS; NORTH CURTICE – CEDAR POINT – LALLENDORF – SEAMAN – COY – NAVARRE – WHEELING – STARR – BROWN. TRUNK ELEVATION VARIES FROM FOUR TO TEN FEET.

NO EXCAVATION WILL BE PERMITTED OVER, UNDER, OR IN THE IMMEDIATE VICINITY OF THE TRUNK MAINS WITHOUT PRIOR PERMISSION FORM THE DIRECTOR OF PUBLIC SERVICE OR HIS AUTHORIZED REPRESENTATIVE.

CONTACT THE OREGON DIVISION OF WATER (419–698–7039) TO HAVE THE WATER LINES MARKED. WITH REGARD TO THE VARIOUS OTHER UTILITIES, THEY CAN BE CONTACTED THROUGH OHIO UTILITIES PROTECTION SERVICE AT 800–362–2764.

WATER SUPPLY PIPE

DUCTILE CAST IRON PIPE

DUCTILE CAST IRON PIPE SHALL DESIGNED IN ACCORDANCE WITH AWWA C150 AND MANUFACTURED IN ACCORDANCE WITH AWWA C151. THE PIPE SHALL BE WITH PUSH TYPE JOINTS MEETING THE REQUIREMENTS OF AWWA C–151 AND ANSI THICKNESS CLASS 52. THE PIPE SHALL BE FIELD WRAPPED WITH A MINIMUM 8–MILL THICK POLYETHYLENE TUBE MEETING THE REQUIREMENTS OF AWWA 105. ALL PIPE SHALL BE COATED WITH A BITUMINOUS MATERIAL ON THE OUTSIDE AND SHALL BE CEMENT MORTAR LINED IN ACCORDANCE WITH AWWA C104.

FITTINGS SHALL BE OF DUCTILE IRON, SHALL CONFORM TO AWWA C110 AND/OR C153 LATEST REVISION AND SHALL BE COATED AND LINED AS SPECIFIED FOR THE PIPE. FITTINGS SHALL BE OF THE MECHANICAL JOINT OR PUSH–ON JOINT TYPE IN ACCORDANCE WITH AWWA C111, INCORPORATING RUBBER GASKETS. FITTINGS THAT REQUIRE CONCRETE THRUST BLOCKS SHALL BE COMPLETELY WRAPPED PRIOR TO PLACING THE BLOCKING. ALL VALVE, FIRE HYDRANTS AND OTHER APPURTENANCES SHALL ALSO BE PROPERLY WRAPPED TO EITHER THE GROUND LINE OR THE UNDER SIDE OF THE OPERATING NUT OR VALVE.

DUCTILE CAST IRON PIPE (CONTINUED)

THE PIPE SHALL BE BEDDED WITH FINE EXCAVATED MATERIAL UNDER, AROUND AND OVER THE PIPE FOR A MINIMUM DISTANCE OF 6 INCHES ABOVE THE TOP OF THE PIPE BARREL. THE MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING 6–INCHES IN THICKNESS, LOOSE MEASUREMENT, AND SECURELY COMPACTED BY HAND OR MECHANICAL TAMPING TO SECURE A GOOD COMPACTION WHILE TAKING CARE NOT TO DISPLACE OR DAMAGE THE PIPE OR JOINTS.

PAYMENT FOR WATER MAIN SHALL BE MADE AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR THE RESPECTIVE ITEMS ACCEPTED IN PLACE, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR CLEARING, FURNISHING, HANDLING, PLACING AND LAYING OF PIPES, FITTINGS, POLYETHYLENE TUBE, CONCRETE THRUST BLOCK, RESTRAINING JOINTS, BEDDING MATERIALS, AND FOR ALL LABOR, MATERIAL, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK INCLUDING ALL EXCAVATION, BACKFILL, PAVEMENT REMOVAL AND REPLACEMENT, SUPPORTING OTHER UTILITIES, RESTORATION OF LANDSCAPING, SHEETING, ETC.

PVC WATERLINE AND FITTINGS

THE SPECIFICATIONS OF THE AMERICAN NATIONAL STANDARDS INSTITUTE (AMERICAN WATER WORKS ASSOCIATION), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND THE AMERICAN SOCIETY OF TESTING AND MATERIALS HEREIN REFERRED TO FOR WATER SERVICE MAIN PIPE GATE VALVES, FIRE HYDRANTS, AND OTHER APPURTENANCES, UNLESS OTHERWISE NOTED, SHALL BE THE LAST SPECIFICATIONS AND PIPE LAYING, PVC PIPE SHALL BE DR 18, PRESSURE CLASS 235.

ALL PVC PIPE USED THROUGHOUT THIS PROJECT SHALL CONFORM TO AWWA C900, DR18, (PR 235 PSI) SPECIFICATION, WITH GASKETS MEETING ASTM F477, AND JOINTS IN COMPLIANCE WITH ASTM D3139.

CONTRACTOR TO INSTALL PVC PIPE IN STRICT ACCORDANCE WITH: AWWA C605 AND AWWA M 23 LATEST REVISIONS THEREOF. IF ANY OF THESE DOCUMENTS ARE FOUND TO CONFLICT, THE MOST RESTRICTIVE OF THE REQUIREMENTS SHALL BE MET. PARTICULAR ATTENTION SHALL BE PAID TO THE FOLLOWING ITEMS FROM THESE REFERENCES:

1. ANY SCRATCH OR GOUGE IN THE PIPE THAT IS MEASURED AS 10% OR MORE OF THE WALL SHALL BE CAUSE FOR REJECTION OF THAT PIPE. FOR 8 INCH DR 18 THIS EQUALS 0.0503 INCH, AND FOR 8 INCH DR 14 EQUAL 0.0646 INCH, 12–INCH DR14 EQUALS 0.0943 INCH ETC.
2. SPECIAL CARE SHALL BE TAKEN IN HANDLING OF PVC PIPE IN COLD WEATHER (40 OR LESS) OR WARM WEATHER (73.4 OR MORE)
3. NO PIPE SHOWING EVIDENCE OF SUN BURNING SHALL BE INSTALLED
4. ANY/ALL DEFLECTIONS SHALL BE MADE PER THE MANUFACTURE'S RECOMMENDATIONS AND/OR STANDARDS
5. PVC PIPE SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C605, INCLUDING A MINIMUM OF 4 INCHES OF BEDDING, BACKFILL AROUND THE PIPE AND TO A HEIGHT OF MINIMUM ONE FOOT OVER THE PIPE WITH 1/2–INCH AND LESS CRUSHED STONE OR PEA GRAVEL. THIS BACKFILL SHALL BE COMPACTED IN 8–INCH LIFTS.
6. ALL FITTINGS, VALVES, FIRE HYDRANTS AND OTHER IRON APPURTENANCES, AS WELL AS ANY NUTS AND BOLTS, SHALL BE PROTECTED FROM CORROSION WITH TWO LAYERS OF POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH AWWA C105 INSTALLED WITH ENOUGH TAPE SO AS TO HOLD THE POLYETHYLENE MATERIALS IN PLACE DURING THE BACKFILLING PROCESS.
7. CONTRACTOR SHALL FOLLOW ALL APPROPRIATE GUIDELINES WITH REGARD TO SAFELY TAPPING PRESSURIZED PVC PIPE. CONTRACTOR ASSUMES ALL LIABILITY RELATIVE TO SAFETY AND INJURY RESULTING FROM TAPPING PVC PIPE.
8. ALL FITTINGS, VALVES, FIRE HYDRANTS, ETC. SHALL BE SUPPORTED SUCH THAT THE WEIGHT OF SUCH APPURTENANCE WILL NOT BE TRANSFERRED TO THE ADJOINING PVC PIPE.

ONLY THE CITY OF OREGON MAY OPERATE VALVES.

ALL PIPE FITTINGS AND SPECIALS SHALL BE LAID IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND WITH AWWA C900 AND NFPA.

PIPE INTERIORS SHALL BE THOROUGHLY CLEANED OF DIRT AND FOREIGN MATTER BEFORE LAYING, BY BRUSHING, SWABBING, PRESSURE WASHING OR OTHER METHOD APPROVED BY THE CITY ENGINEER, AND MEANS SHALL BE PROVIDED TO PREVENT ENTRY OF DIRT OR FOREIGN MATERIAL DURING THE PROGRESS OF INSTALLATION.

ALL FITTINGS SHALL BE DUCTILE IRON IN CONFORMANCE WITH AWWA C110 OR AWWA C153. ALL FITTINGS SHALL BE RATED FOR 350 PSI WORKING PRESSURE, HAVE MECHANICAL JOINTS AND BE COATED AND CEMENT–MORTAR LINED IN ACCORDANCE WITH THE DIP SPECIFICATIONS.

1. PIPE 12 INCH AND SMALLER: AWWA C900, 14 INCH AND LARGER: AWWA C905 AS MODIFIED HEREIN OR UNLESS OTHERWISE INDICATED ELSEWHERE IN CONTRACT DOCUMENTS, SUITABLE FOR POTABLE WATER USE.
   - A) CLASS AND THICKNESS: DR18 OR AS NOTED ON THE DRAWINGS, WITH DIP EQUIVALENT OUTER DIAMETERS.
   - B) POTABLE WATER USE: NSF61
   - C) PIPE MARKINGS: AWWA C900 AND AWWA C905
   - D) JOINING PIPES: UTILIZE ELASTOMERIC GASKET PUSH ON JOINTS FOLLOWING AWWA C900 AND C905
   - E) APPROVED MANUFACTURERS:
     IPEX, NATIONAL PIPE, JM EAGLE OR APPROVED EQUAL
2. FITTINGS:
   - A) DUCTILE IRON SPECIFIED HEREIN.
   - B) PUSH–ON RUBBER GASKETED JOINTS: INJECTION–MOLDED MEETING AWWA C907, CLASS 150, OR FABRICATED MEETING AWWA C900, CLASS 200 OR AWWA C905, CLASS 235.
   - C) APPROVED MANUFACTURERS:
     HARRINGTON CORPORATION (HARCO), MULTIFITTINGS.
     FREEDOM PLASTICS OR APPROVED EQUAL

HIGH DENSITY POLYETHYLENE (HDPE) WATERLINE AND FITTINGS

PIPE AND FITTINGS SHALL COMPLY WITH AWWA C906, ASTM F714, AND ASTM D3035 FOR WATER UTILITY USE.

THE POLYETHYLENE SYSTEM WORKING PRESSURE RATING ACCOMMODATES THE NORMAL OPERATING PRESSURE AND THE REPETITIVE SURGES. THE PRESSURE RATING APPLIES AT 80°F OR LESS. THE PIPE SHALL BE PIPE DIMENSION RATIO (DR) – DR11.

1. PIPE

a. POLYETHYLENE PIPE SHALL BE MADE FROM HDPE MATERIAL HAVING A MATERIAL DESIGNATION CODE OF PE4710 OR HIGHER. THE MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM D 3350 AND SHALL HAVE A MINIMUM CELL CLASSIFICATION OF PE445474C. IN ADDITION, THE MATERIAL SHALL BE LISTED AS MEETING NSF–61.

b. THE PIPE AND FITTINGS SHALL MEET THE REQUIREMENTS OF AWWA C906.

c. HDPE PIPE SHALL BE RATED FOR USE AT A PRESSURE CLASS OF 200 PSI.

d. THE OUTSIDE DIAMETER OF THE PIPE SHALL BE BASED UPON THE DUCTILE IRON PIPE SIZE (DIPS) SIZING SYSTEM. THE PIPE DIAMETER SHALL BE AS SPECIFIED. IF HDPE PIPE IS SELECTED, THE NOMINAL OUTSIDE DIAMETER DOES NOT NEED TO MATCH THE INSIDE DIAMETER EQUIVALENCY OF OTHER SPECIFIED PIPE MATERIALS.

e HDPE PIPE SHALL BE OF DOMESTIC MANUFACTURE.

f. THE PIPE SHALL BE MARKED IN ACCORDANCE WITH THE STANDARDS TO WHICH IT IS MANUFACTURED.

g. COLOR IDENTIFICATION BY THE USE OF STRIPES ON PIPE TO IDENTIFY PIPE SERVICE SHALL BE REQUIRED. STRIPES OR COLORED EXTERIOR PIPE PRODUCT SHALL BE BLUE FOR POTABLE WATER.

h. IF ANY GOUGES, SCRAPES, OR OTHER DAMAGE TO THE PIPE RESULTS IN LOSS OF 10% OF THE PIPE WALL THICKNESS, CUT OUT THAT SECTION OR DO NOT USE.

2. FITTINGS

a. BUTT FUSION FITTINGS – FITTINGS SHALL BE MADE OF HDPE MATERIAL WITH A MINIMUM MATERIAL DESIGNATION CODE OF PE4710. BUTT FUSION FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM D3261. MOLDED AND FABRICATED FITTINGS SHALL HAVE A PRESSURE RATING EQUAL TO THE PIPE UNLESS OTHERWISE SPECIFIED ON THE CONSTRUCTION DRAWINGS. ALL FITTINGS SHALL MEET THE REQUIREMENTS OF AWWA C906. MARKINGS FOR MOLDED FITTINGS SHALL COMPLY WITH THE REQUIREMENTS OF ASTM D 3261. FABRICATED FITTINGS SHALL BE MARKED IN ACCORDANCE WITH ASTM F 2206.

a. ELECTROFUSION FITTINGS – FITTINGS SHALL BE MADE OF HDPE MATERIAL WITH A MINIMUM MATERIAL DESIGNATION CODE OF PE 4710. ELECTROFUSION FITTINGS SHALL HAVE A MANUFACTURING STANDARD OF ASTM F1055. FITTINGS SHALL HAVE A PRESSURE RATING EQUAL TO THE PIPE UNLESS OTHERWISE SPECIFIED ON THE CONSTRUCTION DRAWINGS. ALL ELECTROFUSION FITTINGS SHALL BE SUITABLE FOR USE AS PRESSURE CONDUITS, AND HAVE NOMINAL BURST VALUES OF FOUR TIMES THE WORKING PRESSURE RATING (WPR) OF THE FITTING. MARKINGS SHALL BE ACCORDING TO ASTM F 1055.

b. FLANGE AND MECHANICAL JOINT ADAPTERS (MJ ADAPTERS) – FLANGE AND MECHANICAL JOINT ADAPTERS SHALL HAVE A MATERIAL DESIGNATION CODE OF PE4710. FLANGE AND MECHANICAL JOINT ADAPTERS CAN BE MADE TO ASTM D 3261 OR IF MACHINED, MUST MEET THE REQUIREMENTS OF ASTM F 2206. FLANGE AND MJ ADAPTERS SHALL HAVE A PRESSURE RATING EQUAL TO THE PIPE UNLESS OTHERWISE SPECIFIED ON THE CONSTRUCTION DRAWINGS. MARKINGS FOR MOLDED OR MACHINED FLANGE ADAPTERS OR MJ ADAPTERS SHALL BE PER ASTM D 3261. FABRICATED (INCLUDING MACHINED) FLANGE ADAPTERS SHALL BE PER ASTM F 2206.

RESTRAINED JOINT (RJ) PVC WATERLINE

THE SPECIFICATIONS OF THE AMERICAN NATIONAL STANDARDS INSTITUTE (AMERICAN WATER WORKS ASSOCIATION), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND THE AMERICAN SOCIETY OF TESTING AND MATERIALS HEREIN REFERRED TO FOR WATER SERVICE MAIN PIPE GATE VALVES, FIRE HYDRANTS, AND OTHER APPURTENANCES, UNLESS OTHERWISE NOTED, SHALL BE THE LAST SPECIFICATIONS AND PIPE LAYING, RESTRAINED JOINT (RJ) PVC PRESSURE PIPE SHALL BE DR 18, CLASS 235, AWWA C900.

THE RJ PVC PRESSURE PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH THE DIMENSIONS, MATERIALS, QUALITY CONTROL, AND MARKING SPECIFICATIONS FOUND IN AWWA C900. THE PVC PIPE AND COUPLING MATERIAL CONFORMS TO A MINIMUM CELL CLASS OF 12454 AS DEFINED BY ASTM D1784. THE PIPE AND COUPLING COMPOUNDS ARE LISTED IN PPI TR–4 AS A STANDARD GRADE MATERIAL WITH A HYDROSTATIC DESIGN BASIS (HDB) OF 4000 PSI. THE STANDARD PIPE LAYING LENGTH IS 20 FEET.

THE RJ PRESSURE PVC PIPE AND COUPLING SYSTEM PROVIDES A RESTRAINED JOINT BY UTILIZING PRECISION–MACHINED GROOVES ON THE PIPE SPIGOT ENDS AND IN THE COUPLING. WHEN ASSEMBLED, SPLINES ARE INSERTED THROUGH ENTRY HOLES IN THE COUPLING, RESULTING IN A CONTINUOUS CIRCUMFERENTIAL RESTRAINED JOINT THAT LOCKS THE PIPE AND COUPLING TOGETHER. FLEXIBLE ELASTOMERIC GASKETS LOCATED IN GROOVES ON BOTH SIDES OF THE COUPLING PROVIDE A HYDRAULIC PRESSURE SEAL.

THE RJ PRESSURE PVC PIPE JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D3139. ALL PRODUCTS ARE SUPPLIED WITH ISOPRENE/STYRENE–BUTADIENE RUBBER BLEND (IR/SBR) GASKETS. ALL GASKET MATERIAL OPTIONS SHALL MEET THE REQUIREMENTS OF ASTM F477.

ALL PIPE FITTINGS AND SPECIALS SHALL BE LAID IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND WITH AWWA C605 AND NFPA.

PIPE INTERIORS SHALL BE THOROUGHLY CLEANED OF DIRT AND FOREIGN MATTER BEFORE LAYING, BY BRUSHING, SWABBING, PRESSURE WASHING OR OTHER METHOD APPROVED BY THE CITY ENGINEER, AND MEANS SHALL BE PROVIDED TO PREVENT ENTRY OF DIRT OR FOREIGN MATERIAL DURING THE PROGRESS OF INSTALLATION.

TRACER TAPE/WIRE

THE CONTRACTOR SHALL FURNISH AND INSTALL DURING BACKFILL OPERATION FOR THE WATERLINE, 2 INCH IN WIDTH PRINTED POLYETHYLENE BLUE (WATER) TAPE. THIS IS TO BE PLACED THREE (3) FEET ABOVE THE CROWN OF THE PIPE.

NO SEPARATE OR EXTRA PAYMENT WILL BE MADE FOR THE FURNISHING AND INSTALLATION OF THE MARKER TAPE AND ALL COSTS SHALL BE INCLUDED FOR PAYMENT UNDER THE APPLICABLE BID ITEM(S) TO WHICH IT IS RELATED.

ALL DETECTABLE TRACING WIRE SHALL BE INSTALLED WITH PVC/HDPE WATER MAINS AND SERVICES. THE WIRE SHALL BE INSULATED NO.12 COPPER ELECTRICAL WIRE (THW). SPLICES IN TRACKING WIRE SHALL BE MADE WITH SHRINK TYPE BUTT–END ELECTRICAL CONNECTORS. AFTER INSTALLATION, THE TRACER WIRE SHALL BE TESTED FOR CONTINUITY BETWEEN ALL ACCESS POINTS TO THE TRACER WIRE, SUCH AS FIRE HYDRANTS, VALVES BOXES, ETC. ANY DISCONTINUITIES SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.

THE TRACING WIRE SHALL BE CONNECTED TO EACH VALVE AND SHALL BE PLACED ABOVE THE PIPE.

SCALE: AS SHOWN
DRAWN: A.L.B.
CHECKED:
DATE: 02/13/26

WATERLINE NOTES & DETAILS

CITY OF OREGON

1/6

MECHANICAL JOINT RESTRAINT

RESTRAINED JOINTS SHALL BE PROVIDED AT ALL FITTINGS AND TO THE LENGTHS, IN FEET, IN ACCORDANCE WITH MANUFACTURES'S RECOMMENDATIONS AND NFPA STANDARD.

PIPE SHALL BE ANCHORED AT DEAD ENDS, BENDS, TEES, VALVES AND OTHER FITTINGS REQUIRING RESTRAINT BY MEANS OF MECHANICAL JOINT RESTRAINT. MECHANICAL JOINT RESTRAINT SHALL BE INCORPORATED IN THE DESIGN OF THE FOLLOWER GLAND AND SHALL INCLUDE A RESTRAINING MECHANISM WHICH, WHEN ACTUATED, IMPARTS MULTIPLE WEDGING ACTION AGAINST THE PIPE, INCREASING ITS RESISTANCE AS THE PRESSURE INCREASES. FLEXIBILITY OF THE JOINT SHALL BE MAINTAINED AFTER BURIAL. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A 536–80. RESTRAINING DEVICES SHALL BE OF DUCTILE IRON HEAT TREATED TO A MINIMUM HARDNESS OF 370 BHN. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARDIZED MECHANICAL JOINT BELL AND TEE–HEAD BOLTS CONFORMING TO ANSI/AWWA A21.11 AND ANSI/AWWA C153/A21.53 OF LATEST REVISION. TWIST–OFF NUTS SHALL BE USED TO INSURE PROPER ACTUATING OF THE RESTRAINING DEVICES. THE MECHANICAL JOINT RESTRAINT DEVICE SHALL HAVE A WORKING PRESSURE OF AT LEAST 250 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1

NUTS AND BOLTS

NUTS AND BOLTS SHALL BE 316 STAINLESS STEEL, LOW–ALLOY/CORROSION RESISTANT STEEL WITH POLYTETRAFLUOROETHYLENE COATING, OR APPROVED EQUAL.

ANCHORS AND SUPPORTS

CONCRETE ANCHORS AND SUPPORTS SHALL BE PROVIDED AT FITTINGS, VALVES OR CHANGES IN DIRECTION OF THE PIPE (AS A SUPPLEMENT TO MECHANICAL JOINT RESTRAINTS, AS DIRECTED BY THE ENGINEER). THEY SHALL BE CONSTRUCTED OF CLASS I CONCRETE, AS SHOWN ON DETAIL SHEET, AND SHALL BE PLACED AGAINST FIRM UNDISTURBED SOIL. ALL PLUG OR CAPS SHALL BE SECURELY STRAPPED OR BLOCKED.

INSTALLATION

ALL PIPE AND APPURTENANCES SHALL BE INSTALLED TRUE TO LINE, GRADE, AND LOCATION WITH JOINTS CENTERED; SPIGOTS HOME; PROPER SUPPORT AND BLOCKING PROVIDED; AND ALL VALVE STEMS PLUMB. CARE SHALL BE USED TO LAY THE PIPE SO THAT IT IS SUPPORTED BY THE FULL LENGTH OF THE BARREL. THE PIPE SHALL HAVE APPROXIMATELY 5' OF COVER. WHERE CONFLICTS OCCUR WITH OTHER UTILITIES A MINIMUM OF 18–INCH VERTICAL SEPARATION IS REQUIRED. WHERE SPECIAL CONDITIONS WARRANT, THE DEPTH OF COVER MAY BE CHANGED. ALL TRENCHES AND EXCAVATIONS SHALL BE BACKFILLED IMMEDIATELY AFTER PIPE IS LAID THEREIN. NO MATERIAL SHALL BE USED FOR BACKFILLING THAT CONTAINS STONES, ROCK OR PIECES OF MASONRY, FROZEN EARTH, DEBRIS OF EARTH WITH AN EXCEPTIONALLY HIGH VOID CONTENT. TRENCHES OUTSIDE THE LIMITS OF 5 FEET FROM THE EDGE OF PAVEMENT SHALL BE BACKFILLED WITH THOROUGHLY TAMPED GRANULAR MATERIAL A MINIMUM OF 12 INCHES ABOVE THE TOP OF THE PIPE. THE REMAINDER OF THE TRENCH MAY BE FILLED WITH EXCAVATED MATERIAL, INSOFAR AS IT IS OF SUITABLE CHARACTER.

WATERLINE LENGTHS

ALL LENGTHS SHOWN ON PLAN VIEWS ARE MEASURED FROM CENTERLINE OF VALVE OR FITTINGS IF APPLICABLE

WHENEVER IT IS NECESSARY TO CUT THE PIPE AT FITTINGS, VALVES, SPECIALS, OR ELSEWHERE, THE REMAINING PORTIONS MAY BE USED WHERE POSSIBLE TO MINIMIZE THE NUMBER OF SCRAP PIECES WHEN THE PROJECT IS COMPLETE; HOWEVER, SCRAP PIECES LESS THAN 5–FEET IN LENGTH SHALL NOT BE USED.

PIPE LAYING

PIPE SECTIONS SHALL BE STRUNG ALONG THE ROUTE OF THE MAINS SO AS TO INTERFERE LEAST WITH PEDESTRIAN AND VEHICULAR TRAFFIC AND TO PROTECT THE PIPE AS FULLY AS POSSIBLE. CARE SHALL BE TAKEN AT ALL TIMES IN HANDLING THE PIPE SO AS NOT TO INJURE IT IN ANY WAY AND AT NO TIME SHALL OTHER PIPES OR MATERIAL BE PLACED IN THE PIPES.

RUBBER TIRED EQUIPMENT SHALL BE USED ON ALL PAVED SURFACES DURING PIPE LAYING AND ALL RELATED OPERATIONS. HEAVY EQUIPMENT SHALL NOT BE DRIVEN OVER STREETS, BUT SHALL BE MOVED BY TRAILER.

PIPE LAYING (CONTINUED)

THE MAINS SHALL BE LAID IN THE LOCATIONS AND AT THE GRADES SHOWN ON THE PLANS, EXCEPT AS SPECIFICALLY PERMITTED OR ORDERED OTHERWISE BY THE CITY OR THEIR ENGINEER IN ORDER TO AVOID EXISTING OR PROPOSED UTILITY LINES OR ANY OTHER OBSTRUCTIONS ENCOUNTERED IN THE PROGRESS OF THE WORK; TO SECURE A MORE READILY ACCESSIBLE POSITION FOR TRENCHING; OR TO FACILITATE THE LOCATION OF VARIOUS APPURTENANCES OF THE MAINS.

EXISTING UTILITIES OR OTHER OBSTRUCTIONS ALONG THE ROUTE OF THE MAINS SHALL BE LOCATED AND THE ELEVATION DETERMINED AT LEAST 200 FEET IN ADVANCE OF PIPE LAYING.

ALL UTILITIES, WHEN ENCOUNTERED, SHALL BE ADEQUATELY SUPPORTED, SHORED UP OR OTHERWISE PROTECTED WHENEVER EXPOSED IN THE EXCAVATION TO THE SATISFACTION OF THE CITY OR THEIR ENGINEER. TIMBER SUPPORTS SHALL BE A MINIMUM OF 6–INCHES SQUARE. SUPPORT OF UTILITIES PERPENDICULAR TO THE EXCAVATION SHALL BE IN ACCORDANCE WITH DETAIL.

PLANS SHALL INDICATE THE LOCATION OF EXISTING UTILITIES, IN ACCORDANCE WITH THE BEST INFORMATION PRESENTLY AVAILABLE, BUT NEITHER THE CITY OR THEIR ENGINEER ASSUMES ANY RESPONSIBILITY FOR THE ACCURACY OF THEIR LOCATION OR THAT ALL UTILITIES ARE SHOWN.

WHEN ABRUPT CHANGES IN THE GRADE OF THE MAIN ARE NECESSARY TO AVOID EXISTING UTILITIES OR OTHER OBSTRUCTIONS, SUITABLE FITTINGS, USUALLY 1/8 BENDS, SHALL BE USED, UNLESS OTHERWISE SPECIFIED, SO AS TO SECURE AN EASY FLOW OF LIQUID AND TO PROVIDE SUFFICIENT COVER BELOW SAME. PIPE SHALL BE SO LOCATED WITH RESPECT TO OTHER UTILITIES AS TO ALLOW FOR TAPS TO BE INSERTED. A MINIMUM CLEARANCE OF ONE FOOT IN ALL DIRECTIONS SHALL BE MAINTAINED.

ALL PIPES SHALL BE THOROUGHLY CLEANED INSIDE AND OUTSIDE BEFORE BEING LOWERED INTO THE TRENCH; SHALL BE KEPT CLEAN DURING AND AFTER LAYING; AND THE END OF THE PIPE SHALL BE PLUGGED TO EXCLUDE WATER, ANIMALS OR OTHER MATTER WHEN PIPE LAYING IS STOPPED FOR ANY REASON.

REMOVAL OF EXCAVATED MATERIAL AND STORAGE OF MATERIALS

ALL EXCESS EXCAVATED MATERIAL WHICH HAS BEEN STOCKPILED AT THE WORK SITE, AND WHICH WILL NOT BE USED FOR BACKFILL OR OTHER FILL PURPOSES, MUST BE REMOVED FROM THE PROJECT AREA WITHIN FORTY–EIGHT (48) HOURS. IN ALL CASES, STOCK PILES OF ALL EXCAVATED MATERIAL AND ALL CONSTRUCTION MATERIALS SHALL BE OF LIMITED SIZE AND SHALL BE NEATLY MAINTAINED IN SUCH A MANNER THAT THEY WILL NOT BLOCK EXISTING DRAINAGE OR BE HAZARDOUS TO PEDESTRIAN OR VEHICULAR TRAFFIC IN ANY WAY. THE LIMITATION RELATIVE TO THE STOCKPILING OF ALL EXCAVATED MATERIAL AS REQUIRED ABOVE, OR FAILS TO SATISFACTORILY MODIFY HIS OPERATIONS RELATIVE TO THE STOCKPILING OF EXCAVATED OR CONSTRUCTION MATERIALS UPON ORDER OF THE CITY OR THEIR ENGINEER, ALL WORK EXCEPT CLEAN–UP OPERATIONS WILL BE STOPPED, AND REMAIN STOPPED UNTIL THE ORDER OF THE CITY OR THEIR ENGINEER HAS BEEN COMPLIED WITH.

THE REMOVAL AND DISPOSAL OF SURPLUS EXCAVATED MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, BUT THE LOCATION OF THE DISPOSAL AREAS SHALL BE SUBJECT TO THE APPROVAL OF THE CITY OR THEIR ENGINEER. HOWEVER, THE CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY IN THE DISPOSAL OF WASTE MATERIALS EVEN THOUGH THE LOCATION OF THE SITE FOR SUCH MATERIAL MAY HAVE BEEN APPROVED BY THE CITY OR THEIR ENGINEER.

PROGRESS

THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE BACKFILLING OPERATIONS AND GENERAL CLEAN–UP WITHIN A REASONABLE DISTANCE OF TRENCHING AND PIPE LAYING OPERATIONS AND OTHER EXCAVATIONS. THE SPECIFIC LIMITATIONS OF THIS PARAGRAPH SHALL BE AT THE DISCRETION OF THE CITY OR THEIR ENGINEER, BUT THE GENERAL INTENT IS TO REQUIRE THE CONTRACTOR TO MINIMIZE THE INCONVENIENCE TO NEARBY RESIDENTS OR BUSINESSES WHERE THE MAINS ARE CONSTRUCTED IN STREETS AND ALLEYS OR IN OTHER LOCATIONS WHERE THE CONSTRUCTION PRODUCES AN INCONVENIENCE TO NEARBY RESIDENCES OR BUSINESSES. THE CITY OR THEIR ENGINEER SHALL BE PERMITTED TO REQUIRE THE CONTRACTOR TO CEASE TRENCHING AND PIPE LAYING OPERATIONS AT SUCH TIME AS HE FEELS THAT BACKFILLING AND CLEAN–UP HAVE NOT PROGRESSED SATISFACTORILY.

TRENCHES

TRENCHES FALLING WITHIN THE AREA BELOW A LINE DRAWN AT 1:2 (1 HORIZONTAL AND 2 VERTICAL) FROM THE EDGE OF PAVEMENT OR BACK OF CURB AND ABOVE THE HORIZONTAL PLANE OF THE PIPE EMBEDMENT MATERIAL SHALL BE BACKFILLED WITH APPROVED GRANULAR MATERIAL. TRENCHES FALLING UNDER EXISTING OR PROPOSED PAVEMENT SHALL BE BACKFILLED WITH GRANULAR MATERIAL MEETING REQUIREMENTS OF ODOT ITEM 304 TO THE SUBGRADE. THE CITY OF OREGON RESERVES THE RIGHT TO ORDER COMPACTION TESTS, IF IT DEEMS THEM NECESSARY. PIPE OUTSIDE THE LIMITS NOTED ABOVE SHALL BE BACKFILLED WITH SUITABLE EXCAVATED MATERIAL.

EXCEPT WHERE OTHERWISE SPECIFICALLY REQUIRED OR PERMITTED BY THE CITY OR THEIR ENGINEER, THE MAINS SHALL BE LAID IN OPEN TRENCH EXCAVATED TO A DEPTH SUFFICIENT TO PROVIDE NOT LESS THAN 5–FEET OF VERTICAL COVER, UNLESS OTHERWISE NOTED. HOWEVER, PIPES SHALL BE INSTALLED AT A GREATER DEPTH WHEN SHOWN ON THE PLANS; WHEN NECESSARY TO PASS UNDER OTHER UTILITIES OR OBSTRUCTIONS; OR WHERE NECESSARY TO PREVENT HIGH POINTS IN THE MAIN. IN ADDITION TO THE MINIMUM VERTICAL COVER, WHERE ANY PIPES PARALLEL ROADSIDE DITCHES OR STREAMS, A LATERAL COVER SHALL BE PROVIDED AT LEAST EQUAL TO THE SPECIFIED VERTICAL COVER.

SUFFICIENT SPACE SHALL BE PROVIDED IN THE TRENCH FOR PROPERLY MAKING THE JOINTS WITHOUT RAISING THE LENGTH OF PIPE ABOVE THE SOLID BOTTOM ON THE TRENCH. CARE SHALL BE TAKEN TO DETECT AND REMOVE ANY STONE, BOULDER OR OTHER DEBRIS THAT MIGHT BE ENCOUNTERED IN THE BOTTOM OF THE TRENCH WHICH WOULD DAMAGE THE PIPE OR BE DETRIMENTAL TO THE PROPER BEDDING OF THE PIPE.

WHERE THE PIPE LINES ENTER THE PAVED LIMITS OF A STREET, ALLEY, DRIVEWAY OR PARKING AREA, THE PAVEMENT SHALL BE NEATLY CUT AND THE MAIN INSTALLED IN OPEN TRENCH, IF PERMITTED BY THE CITY, OTHERWISE IT SHALL BE BORED. PAVEMENT CROSSINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR MAINTAINING TRAFFIC AS SUBSEQUENTLY SPECIFIED.

WHERE CATCH BASINS ARE IN THE LINE OF CONSTRUCTION, THE CONTRACTOR SHALL TUNNEL UNDER THE BASINS TO INSTALL THE PIPE, UNLESS OTHERWISE INSTRUCTED.

ON PRIVATE LAWNS, OUTSIDE OF RIGHT–OF–WAY, THE SOD OVER THE TRENCH SHALL FIRST BE REMOVED AND PLACED IN A PROTECTED AREA ADJACENT TO THE TRENCH.

BACKFILLING

ALL TRENCHES AND EXCAVATIONS SHALL BE BACKFILLED IMMEDIATELY AFTER PIPE IS LAID THEREIN, NO MATERIAL SHALL BE USED FOR BACKFILLING THAT CONTAINS STONES, ROCK OR PIECES OF MASONRY, FROZEN EARTH, DEBRIS OR EARTH WITH AN EXCEPTIONALLY HIGH VOID CONTENT. TRENCHES OUTSIDE THE LIMITS OF 5 FEET FROM THE EDGE OF PAVEMENT, PAVED OR STONE BERM OR BACK OF CURB SHALL BE BACKFILLED WITH THOROUGHLY TAMPED GRANULAR MATERIAL A MINIMUM OF 12 INCHES ABOVE THE TOP OF THE PIPE. THE REMAINDER OF THE TRENCH MAY BE FILLED WITH EXCAVATED MATERIAL, INSOFAR AS IT IS OF SUITABLE CHARACTER. TRENCHES WITHIN 5 FEET OF BACK OF THE CURB, EDGE OF PAVEMENT OR EDGE OF PAVED OR STONE BERM SHALL BE BACKFILLED WITH THOROUGHLY TAMPED GRANULAR MATERIAL TO THE PAVEMENT SUBGRADE.

GRANULAR BACKFILL SHALL CONFORM TO THE GRADATION REQUIREMENTS OF THE CURRENT SPECIFICATIONS FOR ITEM 703.11, TYPE 1, (304 ONLY) OF THE 2023 CONSTRUCTION AND MATERIAL SPECIFICATIONS, STATE OF OHIO, DEPARTMENT OF TRANSPORTATION. (MAX. DRY DENSITY EXCEEDING 105LBS. PER CUBIC FEET AND COMPACTION TO 100% OF THE STANDARD PROCTOR TEST). GRANULAR MATERIAL MAY BE COMPACTED WITH WATER IF SATISFACTORY DRAINAGE IS PROVIDED FOR THE EXCESS WATER. WHEN COMPACTING WITH WATER, THE GRANULAR MATERIAL MAY BE PLACED IN LAYERS NOT TO EXCEED 8 INCHES LOOSE DEPTH AND EACH LAYER THOROUGHLY SATURATED WITH WATER BY FLOODING OR JETTING. PRIOR TO THE PLACEMENT OF SOIL OVER THE GRANULAR MATERIAL, THE EXCESS WATER SHOULD BE DRAINED.

OHIO E.P.A. REQUIREMENTS

THE OHIO ENVIRONMENTAL PROTECTION AGENCY REQUIRES A CONFORMANCE TO THE 2018 EDITION OF "TEN STATES STANDARDS." THIS STANDARD SHALL BE EQUALED OR EXCEEDED FOR WATERLINES. SPECIAL ATTENTION SHALL BE GIVEN TO THE FOLLOWING SECTIONS OF PART 8.

8.1.1	MATERIALS CONFORM TO AWWA STANDARDS
8.2.2	MINIMUM 6" DIAMETER FIRE PROTECTION
8.4.4	HYDRANT DRAINAGE
8.7.3	COVER
8.7.6	PRESSURE TESTING AWWA C–600*
8.7.7	DISINFECTION AWWA C–651*
8.8.2	10' HORIZONTAL SEPARATION WATER MAIN/SEWER
8.8.3	18" VERTICAL SEPARATION WATER MAIN/SEWER
8.8.6	NO ENTRY AND/OR CONTACT WITH SEWER MANHOLE

*NOTE: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THIS TEST PROPERLY AND THEIR RESPONSIBILITY FOR ADEQUATE SUPERVISION AND APPROVAL RESTS WITH THE APPROPRIATE GOVERNMENTAL AGENCY. ANY DEVIATION FROM THE ABOVE WILL NOT BE PERMITTED UNLESS SPECIFICALLY INCLUDED IN THE GENERAL NOTES OR OTHERWISE SHOWN ON THESE PLANS.

IN CASES WHERE ONE AND/OR MORE OF THE ABOVE MENTIONED OHIO E.P.A. STANDARDS FALL SHORT OF THE CITY OF OREGON, WATER DEPARTMENT, THE LATTER SHALL GOVERN.

PRESSURE AND LEAKAGE TESTING

THE CONTRACTOR SHALL MAKE PRESSURE AND LEAKAGE TESTS OF ALL PIPE LINES ACCORDANCE WITH AWWA C600 LATEST REVISION UNLESS OTHERWISE DIRECTED BY THE CITY OF OREGON.

PRESSURE TESTS SHALL BE MADE IN ALL PIPE LINES, HYDRANTS OR VALVED SECTIONS THEREOF, AS DIRECTED. THE CONTRACTOR SHALL FURNISH THE PUMP, PIPE CONNECTIONS, TAPS, GAUGES AND ALL OTHER APPARATUS FOR MAKING THE TEST. BEFORE TESTING OF THE MAIN, THE CONTRACTOR SHALL FLUSH THE MAIN UNDER THE CITY OF OREGON DIRECTION TO EXPEL ANY WATER, DIRT, CHLORINE, ETC.

THE COST OF FURNISHING ALL MATERIAL, LABOR, EQUIPMENT AND THE TOTAL VOLUME OF WATER FOR TESTING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT CONDUIT ITEM.

DISINFECTION

THE CONTRACTOR SHALL CHLORINATE ALL PIPE LINES, AND THIS SHALL BE DONE PRIOR TO PRESSURE TESTING UNLESS OTHERWISE DIRECTED BY THE CITY. DISINFECTION SHALL MEET OR EXCEED AWWA C651.

THE COST TO COMPLETE SUCH WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT CONDUIT ITEM.

FLUSHING EXISTING WATER MAINS

WHENEVER A CONTRACTOR IS CONNECTING ONTO AN EXISTING WATER MAIN, THE EXISTING WATER MAIN WILL BE FLUSHED THROUGH THE BLOW–OFF ON THE END OF THE MAIN, BEFORE THE NEW PIPE IS CONNECTED TO THE EXISTING WATERLINE.

POLYETHYLENE TUBE

THE WATER LINE SHALL BE FIELD WRAPPED WITH A MINIMUM 8 MIL THICK POLYETHYLENE TUBE MEETING THE REQUIREMENTS OF AWWA C105, WITH THE INSTALLATION IN ACCORDANCE WITH METHOD A AND THE RECOMMENDATIONS OF THE MANUFACTURER. ALL OVERLAPS AND SEAMS SHALL BE COMPLETELY TAPED. ALL RIPS, PUNCTURES AND OTHER DAMAGE TO THE POLYETHYLENE SHALL BE COMPLETELY REPAIRED. TAPE SHALL BE 2 INCH WIDE PLASTIC BACKED ADHESIVE TAPE WHICH WILL BOND SECURELY TO BOTH METAL SURFACES AND THE POLYETHYLENE FILM. FITTINGS THAT REQUIRE CONCRETE THRUST BLOCKS SHALL BE COMPLETELY WRAPPED PRIOR TO PLACING BLOCKING. ALL VALVE, FIRE HYDRANTS AND OTHER APPURTENANCES SHALL ALSO BE PROPERLY WRAPPED TO EITHER THE GROUND LINE OR THE UNDER SIDE OF THE OPERATING NUT OR VALVE. COST OF THE ABOVE SPECIFIED SHALL BE INCLUDED IN THE PRICE BID FOR THE WATER LINE ITEM.

SCALE AS SHOWN

DRAWN A.L.B. CHECKED DATE 02/13/26

WATERLINE NOTES & DETAILS

CITY OF OREGON

RECONNECTION OF SERVICES

ALL EXISTING SERVICES SHALL BE KEPT IN OPERATION UNTIL TRANSITION TO NEW SERVICES. UPON ACCEPTANCE OF INSTALLED WATER MAINS, SERVICES SHALL BE DISCONNECTED FROM EXISTING WATER MAINS AND RECONNECTED TO PROPOSED WATER MAINS AT SIMILAR LOCATIONS.

THIS WORK SHALL INCLUDE A NEW TAPPING SADDLE, CORPORATION STOP, TRACER WIRE, AND A LENGTH OF 1 INCH PVC (SDR 9) (OR LARGER TO MATCH EXISTING), A NEW SERVICE STOP WITH BOX AND A CONNECTION FITTING TO THE EXISTING SERVICE. SHALL BE JACKED OR DRILLED. NO OPEN CUTTING OF PAVEMENT WILL BE ALLOWED. REMOVAL OF EXISTING SERVICE STOP WITH BOX SHALL BE INCLUDED.

THE PROPERTY OWNERS SHALL BE NOTIFIED BY FLIER DELIVERED 24 HOURS IN ADVANCE OF THEIR WATER DISCONNECTION. RECONNECTION WORK SHALL BE COMPLETED IN ONE WORKING DAY, WITHOUT OVERNIGHT DISCONNECTION. PAYMENT FOR THIS WORK SHALL BE MADE FOR PER EACH RECONNECTION UNDER THE CONTRACT.

A TAP CARD SHALL BE COMPLETED FOR EACH SERVICE CONNECTION. THE CITY WILL SUPPLY THE CARD FOR EACH LOCATION.

TAPPING SERVICE SADDLE

1) USE FOR 2 INCH AND SMALLER CONNECTIONS.
2) TAPPING SADDLES SHALL BE STAINLESS STEEL.
3) THEY SHALL BE BAND–TYPE OR DOUBLE STRAP TYPE WITH AWWA TAPERED THREAD INLET.
4) MANUFACTURE SADDLES WITH CLAMPS FOR UNDERGROUND SERVICES:
   A. RATED FOR MINIMUM SERVICE OF 150 PSI
   B. PROVIDE FULL SUPPORT AROUND THE CIRCUMFERENCE OF PIPE.
   C. DO NOT DISTORT, SCRATCH, OR DAMAGE PIPE WHEN TIGHTENED.
   D. CONTAINS THICK TAPPING BOSS, WHICH HAS BEEN PRECISION–MACHINED WITH FULL–LENGTH THREADS FOR WATERTIGHT CONNECTION THAT RESISTS PULLOUT.

SERVICE CONNECTION AND FITTINGS

POLYETHYLENE PLASTIC TUBING FOR POTABLE WATER SUPPLY (SDR 9) SHALL CONFORM TO ASTM D–2737 STANDARDS AND SHALL BE ASSEMBLED USING COMPRESSION FITTINGS CONFORMING TO AWWA C800.

COPPER SERVICE BRANCHES SHALL CONFORM TO ASTM B 88 TYPE K, AND BE ASSEMBLED USING COMPRESSION FITTINGS CONFORMING TO AWWA C800. MINIMUM WORKING PRESSURE FOR THE BRANCHES SHALL BE 150 POUNDS PER SQUARE INCH. THE MATERIAL SHALL BE EITHER COIL TYPE (TEMPER 060 ANNEALED) OR DRAWN TYPE (TEMPER H).

CORPORATION STOP

CORPORATION STOPS FOR USE WITH SADDLES SHALL BE BRONZE ALLOY WITH AWWA TAPERED THREAD, AND OUTLET THREAD COMPATIBLE WITH CONNECTING PIPE, WITHOUT SPECIAL ADAPTERS. CORPORATION STOPS FOR DIRECT TAPPING SHALL BE BRONZE ALLOY WITH AWWA TAPERED INLET THREAD, AND WITH OUTLET THREAD COMPATIBLE WITH CONNECTING PIPE, WITHOUT SPECIAL ADAPTERS.

THREADS: AWWA C800 WITH STANDARD CORPORATION STOP THREAD.

BRASS OR BRONZE ALLOY MEETING ASTM B62 OR B584 AND AWWA C800

SERVICE STOP WITH BOX

SERVICE STOPS SHALL BE BRONZE WITH COUPLING THREADS CONFORMING TO AWWA C–800. THE STOP SHALL BE SO DESIGNATED THAT WATER PRESSURE FROM THE INLET SIDE OF THE BODY SHALL PROVIDE ADDITIONAL SEALING ACTION. SERVICE STOPS SHALL OPEN COUNTER–CLOCKWISE.

CASTINGS: UNIFORM QUALITY, TRUE TO PATTERN, OF EVEN GRAIN, SOUND AND SMOOTH, AND WITHOUT COLD SHUTS, SWELLS, SCALES, BLISTERS, SAND HOLES, CRACKS OR OTHER DEFECTS.

SURFACES: SMOOTH WITH NO BURNT–ON SAND.

USE WATERTIGHT GASKETS OF BUNA–N RUBBER MEETING ASTM D2000 OR NITRITE AROUND TOP.

SERVICE STOP WITH BOX (CONTINUED)

BOXES SHALL BE CAST IRON SCREW TYPE.

ARCH–4" DIAMETER BY 7" HEIGHT INSIDE

SHAFT DIAMETER = 2 1/2"

FOR CURB STOPS THRU 2" SCREW STYLE

CAST IRON "WATER" COVER AND RING WITH BRASS PENTAGON BOLT 47" – 65" RANGE.

ABANDONMENT OF WATERLINE

1.) ALL FIRE HYDRANTS AND PIPING SHALL BE REMOVED UP TO AND INCLUDING THE WATCH VALVE AND VALVE BOX, UNLESS OTHERWISE SPECIFIED.

2.) REMOVE ALL MAIN LINE VALVES, INCLUDING VALVE BOXES.

3.) THE CITY OF OREGON WATER DEPARTMENT SHALL HAVE FIRST SALVAGE RIGHTS TO VALVES AND HYDRANTS.

4.) PAYMENT FOR THE ABOVE WORK SHALL BE INCLUDED UNDER THE CONTRACT ITEM 638 ABANDONMENT OF EXISTING WATERLINES.

ABANDONMENT OF VALVE MANHOLE

1.) ALL VALVE MANHOLES SHALL BE REMOVED UP TO THE TOP SECTION OF THE MANHOLE. THE MANHOLE SHALL BE FILLED WITH CONTROLLED DENSITY FILL (CDF).

2.) REMOVE ALL MAIN LINE VALVES WHERE NOTED ON THE PLANS

3.) THE CITY OF OREGON WATER DEPARTMENT SHALL HAVE FIRST SALVAGE RIGHTS TO VALVES.

4.) ASPHALT PAVEMENT SHALL BE REPLACED PER ASPHALT ROADWAY SECTION ON PAGE 4 OF 14.

4.) PAYMENT FOR THE ABOVE WORK SHALL BE INCLUDED UNDER THE CONTRACT ITEM 638 ABANDONMENT OF VALVE MANHOLES.

CUT AND PLUG

1.) PLUG OR CAP ALL WATERLINES WHERE ANY REMOVAL HAS TAKEN PLACE LEAVING AN OPEN END OF PIPING OR FITTING.

2.) PLUG OR CAP EXISTING WATERLINES WHERE NOTED ON THE PLANS

3.) PLUG OR CAP EXISTING WATERLINES AFTER PROPOSED WATERLINES ARE ACTIVATED.

4.) PAYMENT FOR THE ABOVE CUT AND CAP/PLUG OF WATERLINE SHALL BE PER EACH AND SHALL BE INCLUDED UNDER THE CONTRACT ITEM CUT & PLUG.

REMOVAL AND DISPOSAL OF EXISTING WATER MAIN AND ALL APPURTENANCES

CONTRACTOR TO REMOVE EXISTING HYDRANTS AND MAIN LINE VALVES AND DELIVER THEM TO THE CITY OF OREGON, WATER DEPARTMENT. EXISTING FIRE HYDRANT LINES THAT CROSS UNDER ROADWAYS MAY BE LEFT IN PLACE BUT MUST BE FILLED WITH GROUT.

UTILITY POLE HOLDING

IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE HOLDING AND/OR MOVING OF ANY UTILITY POLE(S) WITH THE OWNER(S) OF SAID POLE(S). ALL COSTS INCURRED FOR HOLDING AND/OR MOVING POLE(S) SHALL BE INCLUDED IN THE BID PRICE FOR PIPE INSTALLED. IT WILL BE THE ULTIMATE RESPONSIBILITY OF THE CONTRACTOR AND OWNER OF THE UTILITY POLE(S) TO MAKE THE DECISION OF HOLDING OR MOVING POLES.

VALVES AND APPURTENANCES – GENERAL

THIS ITEM COVERS GATE VALVES AND TAPPING SLEEVES AND VALVES WHICH MAY BE REQUIRED IN CONNECTION WITH THE INSTALLATION OF THE WATER MAINS. ALL VALVES SHALL BE PROVIDED WITH A VALVE BOX OR SHALL BE INSTALLED WITHIN A MANHOLE AS SUBSEQUENTLY SPECIFIED. VALVES INSTALLED WITH CLASS 52 DUCTILE PIPE SHALL BE WRAPPED AS PREVIOUSLY SPECIFIED.

GATE VALVES

GATE VALVES SHALL BE IRON BODY, BRONZE MOUNTED, DOUBLE DISC, PARALLEL SEAT TYPE MEETING THE REQUIREMENTS OF AWWA C500, OR IRON BODY RESILIENT SEAT TYPE MEETING THE REQUIREMENTS OF AWWA C509. VALVES SHALL BE DESIGNED FOR A WORKING WATER PRESSURE OF 200 PSI AND SHALL BE OF THE NON–RISING STEM TYPE WITH A STANDARD AWWA NUT. THE MANUFACTURER SHALL FURNISH AN AFFIDAVIT INDICATING THAT ALL TESTS AND PROVISIONS OF THE APPLICABLE STANDARD HAVE BEEN MET. VALVES SHALL HAVE MECHANICAL JOINT ENDS. STEM SEALS SHALL CONSIST OF AT LEAST TWO "O" RINGS. VALVES SHALL OPEN BY TURNING TO THE RIGHT (CLOCKWISE). IF REQUIRED, OPERATORS SHALL BE PROVIDED WITH EXTENSION STEMS SUCH THAT THE OPERATING NUT TERMINATES APPROXIMATELY 4 FEET BELOW GRADE. EXTENSION STEMS SHALL BE CENTERED IN THE VALVE BOXES BY APPROVED STEM GUIDES. VALVES SHALL BE SET PLUMB, WITH THE VALVE BOX ACCURATELY CENTERED OVER THE VALVE. THE FOLLOWING MAKES AND MODELS OF VALVES WILL BE PERMITTED:

AMERICAN FLOW CONTROL –– SERIES 500

KENNEDY –– 4571–R

MUELLER –– A2360

ALL FITTINGS SHALL BE DUCTILE IRON, SHALL CONFORM TO AWWA C110 AND C153 AND SHALL BE OF MECHANICAL JOINT OR PUSH–ON TYPE.

TAPPING SLEEVES AND VALVES

TAPPING SLEEVES AND VALVES SHALL BE FURNISHED BY THE CONTRACTOR. THE TAPPING SLEEVE AND VALVE WILL BE INSTALLED BY THE CONTRACTOR IN THE PRESENCE OF THE CITY OF OREGON AUTHORIZED REPRESENTATIVE. THE CITY OF OREGON, DIVISION OF WATER WILL PERFORM THE ACTUAL TAP. ALL EXCAVATION AND BACKFILL SHALL BE PERFORMED BY THE CONTRACTOR AS DETAILED.

A. INSTALLATION REQUIREMENTS – THE EXISTING WATER MAIN INTO WHICH A PRESSURE CONNECTION IS TO BE MADE CANNOT BE SHUT DOWN OR TAKEN OUT OF SERVICE. THE INSTALLATION SHALL BE MADE BY THE CITY OF OREGON OR CONTRACTOR SKILLED AND EXPERIENCED IN THE MAKING OF PRESSURE TAPS. IF A CONTRACTOR HAS BEEN AUTHORIZED TO MAKE THE PRESSURE CONNECTION, THE CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE SELECTION AND ADJUSTMENT OF DRILLING EQUIPMENT AS WELL AS IN THE INSTALLATION, INSPECTION AND CUTTING PROCEDURES. PRIOR TO ORDERING ANY TAPPING SLEEVE ASSEMBLY, THE CONTRACTOR SHALL EXPOSE AND CLEAN A SECTION OF THE EXISTING MAIN AND VERIFY THE CIRCUMFERENCE OF THE PIPE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTION, PROPER ASSEMBLY, ALIGNMENT AND FITTING OF THE TAPPING SLEEVE TO THE MAIN PER AWWA STANDARDS C223 AND C228. THIS INCLUDES PRESSURE TESTING OF THE SLEEVE PER AWWA C223 STANDARDS. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT FOR THIS TESTING. THE CITY OF OREGON OR AUTHORIZED REPRESENTATIVE SHALL CONFIRM THIS FITTING. IN THE EVENT OF ANY MISMATCH OF ANY PURCHASED MATERIALS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REFIT THEM IN THE FIELD OR TO MAKE THE NECESSARY ARRANGEMENTS WITH THE MANUFACTURER FOR FACTORY REFIT.

THE SEVERED SECTION OF WATER MAINS SHALL BE REMOVED THROUGH THE TAPPING VALVE AND GIVEN TO THE CITY OR THEIR ENGINEER AS PROOF OF SATISFACTORY EXECUTION OF THE OPERATION. THE ENGINEER, AT HIS OPTION, MAY RETAIN THE COUPON FOR SUCH ANALYSIS OR TESTS AS ARE NECESSARY TO EVALUATE THE CONDITION OF THE EXISTING WATER MAIN, WATER TREATMENT, DEPOSITS, ETC.

THE CITY OF OREGON, DIVISION OF WATER, HAS THE NECESSARY EQUIPMENT AND EXPERIENCED PERSONNEL TO MAKE PRESSURE TAPS AND WILL PERFORM THE WORK AT THE EXPENSE OF THE CONTRACTOR, UNLESS SUCH TAP IS AT THE REQUEST OF THE CITY. THIS WORK MUST BE SCHEDULED WITH THE CITY OF OREGON, DIVISION OF WATER SUPERVISOR AT 419–698–7038

B. TAPPING SLEEVES – TAPPING SLEEVES SHALL BE MADE IN TWO HALVES FOR ASSEMBLY AROUND THE MAINS. THE HALVES SHALL BE MADE OF STAINLESS STEEL MATERIAL. GASKETS SHALL EXTEND THE ENTIRE LENGTH OF THE SLEEVES TO FORM WATERTIGHT JOINTS WHEN THE SIDE BOLTS ARE TIGHTENED IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS AND AWWA STANDARDS. BRANCH FLANGES SHALL HAVE FEMALE FACES TO ACCOMMODATE MALE FACES OF TAPPING VALVES.

THE FOLLOWING MAKES OF TAPPING SLEEVES WILL BE PERMITTED (OR APPROVED EQUAL): ROMAC INDUSTRIES, INC OR THE FORD METER BOX COMPANY, INC.

SADDLES FOR PVC AWWA C900 AND C905 PIPE: USE TAPPING SADDLE MANUFACTURED SPECIFICALLY FOR AWWA C900 AND C905 PVC PIPE WITH STAINLESS STEEL (316) WIDE BAND STRAPS, NUTS AND WASHERS.

A. TAPPING VALVES – TAPPING VALVES SHALL BE GATE VALVES AS PREVIOUSLY SPECIFIED, EXCEPT AS MODIFIED BY THE FOLLOWING SUPPLEMENTARY REQUIREMENTS:

TAPPING VALVES SHALL BE OF THE CAST IRON BODY, RESILIENT SEAT TYPE, MEETING THE REQUIREMENTS OF AWWA C509–LATEST REVISION.

VALVE OUTLETS SHALL BE MECHANICAL JOINT IN COMPLIANCE WITH AWWA C111. THE CYLINDRICAL SECTION OF THE INTERIOR ANNULAR RECESS OF THE BELL SHALL BE MACHINED WITH THE BORE THROUGH THE SEAT RINGS TO PROVIDE ALIGNMENT FOR THE DRILLING MACHINE.

VALVE LOCATION AND SETTING

MAIN LINE VALVES SHALL BE INSTALLED AT INTERSECTIONS SO AS TO BE ABLE TO ISOLATE THE LINE AND PREVENT BACK FEED AND AT INTERVALS AS SHOWN ON THE PLANS. A GATE (WATCH) VALVE SHALL BE INSTALLED WITH EACH FIRE HYDRANT AS SUBSEQUENTLY SPECIFIED.

MAIN LINE VALVES INSTALLED IN EXISTING OR PROPOSED PAVED AREAS OR AS OTHERWISE REQUIRED BY THE CITY SHALL BE INSTALLED IN MANHOLES. VALVES INSTALLED AT ALL OTHER LOCATIONS SHALL BE WITH A VALVE BOX AS SUBSEQUENTLY SPECIFIED. VALVES SHALL SET PLUMB WITH THE MANHOLE ACCURATELY CENTERED OVER THE VALVE AND WITH THE TOP OF THE MANHOLE COVER FLUSH WITH THE SURFACE OF THE GROUND OR PAVEMENT.

WATCH VALVES INSTALLED WITH FIRE HYDRANTS AND ALL OTHER MAIN LINE VALVES SHALL BE INSTALLED WITH VALVE BOXES. VALVES SHALL BE SET PLUMB WITH VALVE BOX CENTERED OVER THE VALVE AND WITH THE TOP OF THE BOX FLUSH WITH THE SURFACE OF THE GROUND OR PAVEMENT.

VALVE BOXES

VALVE BOXES SHALL BE CONSTRUCTED OF A GOOD GRADE OF CAST IRON; SHALL BE COATED; SHALL BE OF THE THREE PIECE SCREW TYPE; SHALL HAVE A 5 1/4 INCH SHAFT; AND SHALL BE PROVIDED WITH A HEAVY NEED FITTING COVER HAVING THE WORD "WATER" CAST ON THE TOP. BASES SHALL COVER THE ENTIRE BONNET SECTION OF THE VALVE. BOXES SHALL CORRECTLY SET ON VALVE BODY AND SHALL EXTEND TO THE GROUND ELEVATION WITH SUFFICIENT LENGTH FOR EACH SECTION TO BE PROPERLY ENGAGED.

VALVE MANHOLES

ALL MAIN LINE VALVES SHALL BE ENCLOSED IN STANDARD VALVE MANHOLES AS SHOWN IN ATTACHED DETAILS. MANHOLES SHALL BE CONSTRUCTED OF EITHER APPROVED SOLID CONCRETE (CIRCULAR) BLOCK OR APPROVED PRECAST MANHOLE SECTIONS MEETING ASTM C–478. MANHOLE WALLS SHALL REST ON A CLASS 1 REINFORCED CONCRETE OR BERM STONE (ODOT ITEM 411) FOUNDATION AS SHOWN. IF BLOCK IS USED, A 1/2" COAT OF CEMENT MORTAR, INSIDE AND OUT, MUST BE PROVIDED. WHERE PIPE PASSES THROUGH THE WALLS PROVIDE A GASKETED FLEXIBLE WATERTIGHT CONNECTION (KOR–N–SEAL, OR EQUAL), OR 1/2" JUTE ROPING OR NEOPRENE GASKET MATERIAL.

WHERE SPECIFIED, MANHOLE STEPS MEETING ASTM C–478 SHALL BE PROVIDED AND SHALL BE OF ALUMINUM OR REINFORCED POLYPROPYLENE.

FOR PRECAST SECTIONS, TOPS SHALL BE OF THE ECCENTRIC OR FLAT SLAB TYPE AND SHALL BE CONSTRUCTED OF CLASS 1 REINFORCED CONCRETE. IF PRECAST SECTIONS ARE USED, A MINIMUM OF 6" OF ADJUSTING RINGS MUST BE PROVIDED.

VALVES MUST BE POSITIONED INSIDE MANHOLE SO AS TO ALLOW UNOBSTRUCTED ACCESS TO VALVE OPERATING NUT WITH VALVE WRENCH.

VALVE MANHOLE CASTINGS

VALVE MANHOLE FRAMES AND COVERS SHALL BE 22 INCH NEENAH R–1771, OR APPROVED EQUAL, ASTM–A48 WITH INTERCHANGEABLE PIECES AND MACHINED HORIZONTAL BEARING SURFACES.

IF CASTINGS ARE DELIVERED TO THE JOB UNPAINTED, THEY SHALL BE GIVEN ONE COAT OF ASPHALT VARNISH OR COAL–TAR PITCH PAINT BY THE CONTRACTOR.

MANHOLE/HYDRANT GRADES

CONTRACTOR SHALL ADJUST MANHOLE RIM GRADES AS SHOWN ON DRAWINGS TO ACTUAL SURROUNDING GRADE OR AS DIRECTED BY THE ENGINEER. NO ACTUAL PAYMENT IS ALLOWED FOR THESE ADJUSTMENTS.

ONLY THE CITY OF OREGON MAY OPERATE VALVES.

SCALE AS SHOWN

DRAWN A.L.B. CHECKED DATE 02/13/26

WATERLINE NOTES & DETAILS

CITY OF OREGON

FIRE HYDRANTS AND APPURTENANCES – GENERAL

THIS ITEM COVERS FIRE HYDRANTS, WATCH VALVES AND VALVE BOXES, HYDRANT TEES, ANCHORING FITTINGS AND ANCHORING PIPE WHICH MAY BE REQUIRED IN CONNECTION WITH THE INSTALLATION OF THE WATER MAINS. HYDRANTS IN NEW SUBDIVISIONS SHALL BE 4–FOOT UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE DIRECTOR OF PUBLIC SERVICE. FIRE HYDRANTS AND APPURTENANCES WHEN INSTALLED WITH CLASS 52 DUCTILE PIPE SHALL BE WRAPPED AS PREVIOUSLY SPECIFIED.

HYDRANT INSTALLATION

HYDRANTS SHALL BE SET PLUMB AND TO THE GRADE OF THE CURB, STREET, ALLEY, HIGHWAY OR RIGHT–OF–WAY AT THE DIRECTION OF THE CITY OR THEIR ENGINEER AND SHALL BE OF THE OVER MAIN TYPE OR OFFSET TYPE AS SUBSEQUENTLY SPECIFIED. PUMPER NOZZLE SHALL ALWAYS BE SET TOWARD THE MIDDLE LINE OF THE STREET, HIGHWAY OR RIGHT–OF–WAY. EXCAVATION FOR HYDRANTS SHALL FIRST BE BACKFILLED WITH NO. 6 STONE TO A MINIMUM DEPTH OF TWO FEET AS SHOWN ON THE PLANS. REMAINDER OF EXCAVATION SHALL THEN BE BACKFILLED AS PREVIOUSLY SPECIFIED FOR PIPE LAYING.

FOR THE OVER THE MAIN TYPE, THE HYDRANT BASE SHALL REST ON A TREATED WOOD TIMBER SUPPORTED BY TWO VERTICAL BLOCKS. THE TIMBER SHALL BE THE LARGEST NOMINAL SIZE SQUARE TIMBER WHICH WILL FIT BETWEEN THE HYDRANT BASE AND THE TOP OF THE MAIN, WITH THE BLOCKS TO BE THE SAME SIZE. THE HORIZONTAL TIMBER SHALL BE SPIKED TO THE VERTICAL BLOCKS TO PREVENT THE MOVEMENT OF SAME DURING SUBSEQUENT BACKFILLING OPERATIONS. EACH HYDRANT SETTING SHALL CONSIST OF A TEE, CLOW F–288 AND AN ANCHORING ELBOW CLOW F–1218 OR CITY APPROVED EQUAL, SET VERTICAL AND TIED SECURELY TO THE WATCH VALVE AND HYDRANT WITH ONE MINIMUM THREE FOOT LONG PIECE OF ANCHORING PIPE, CLOW F–1216 OR CITY APPROVED EQUAL. SEE DETAIL 4.

FOR THE OFFSET TYPE, THE HYDRANT BASE SHALL BE PROVIDED WITH A FOUNDATION OF NO. 6 STONE TO A MINIMUM DEPTH OF AT LEAST 6–INCHES THICK. EACH HYDRANT CONNECTION TO THE MAIN SHALL BE MADE BY MEANS OF AN ANCHORING TEE, CLOW F–1217 OR APPROVED EQUAL, TIED SECURELY TO THE WATCH VALVE AND HYDRANT WITH THE REQUIRED LENGTHS OF ANCHORING PIPE, CLOW F–1216 OR CITY APPROVED EQUAL. SEE DETAIL 5.

FIRE HYDRANTS – NOTE THE NOZZLE SPECIFICATION FOR OREGON

FIRE HYDRANTS SHALL BE OF THE COMPRESSION TYPE, OPENING AGAINST AND CLOSING WITH THE WATER PRESSURE IN THE MAIN, HAVING A 5–1/4 INCH VALVE OPENING, TWO 2–1/2 INCH HOSE NOZZLES (2.984 INCHES O.D., 8 THREADS PER INCH, "V" STYLE). HYDRANTS SHALL CONFORM TO AWWA C502, LATEST REVISION. THE MANUFACTURER SHALL FURNISH AN AFFIDAVIT INDICATING THAT ALL TESTS AND PROVISIONS OF AWWA C502 HAVE BEEN MET.

THE FOLLOWING MAKES AND MODELS OF HYDRANTS WILL BE PERMITTED:

AMERICAN–DARLING	B–84–B
KENNEDY	K–81A
MUELLER	A–423, SUPER CENTURION 200

THE HYDRANT BARREL SHALL HAVE AN INSIDE DIAMETER OF NOT LESS THAN 6 INCHES AND SHALL BE IN TWO PARTS FASTENED TOGETHER WITH A FRANGIBLE SECTION LOCATED JUST ABOVE GROUND LINE. THE HYDRANT STEM SHALL HAVE A BREAKABLE COUPLING IN THE SAME PLANE AS THE FRANGIBLE SECTION. STEM SHALL TERMINATE AND 1.50 INCHES POINT TO FLAT. SEALS SHALL BE RUBBER O–RINGS. HYDRANTS SHALL BE SUITABLE FOR SETTING IN TRENCHES OF THE DEPTHS SHOWN OR AS REQUIRED. THE HYDRANTS SHALL BE DESIGNED SO THAT WHEN PROPERLY OPERATED WATER HAMMER WILL BE PREVENTED. HYDRANTS SHALL BE FURNISHED WITH A POSITIVE–OPERATING DRAIN VALVE WITH REMOVAL PLUG AND SHALL BE FURNISHED WITH A 6 INCH MECHANICAL JOINT BASE. HYDRANTS SHALL OPEN BY TURNING TO THE LEFT (COUNTER–CLOCKWISE).

THE CONTRACTOR SHALL VERIFY THAT THE HYDRANT FURNISHED AND THAT THE HYDRANT PUMPER NOZZLE WITH 5 INCH STORZ FITTING, OPERATING NUT, OUTLET NOZZLE CAP NUTS AND HOSE THREADS CONFORM TO THOSE IN THE SYSTEM BEFORE NEW HYDRANTS ARE SHIPPED.

EACH HYDRANT EXTERIOR, IN ADDITION TO FINISHING AS REQUIRED BY AWWA C502, SHALL BE GIVEN ONE FIELD COAT OF ASPHALT VARNISH AFTER ERECTION AND BEFORE BACKFILLING FROM GROUND LEVEL DOWN. THAT PART OF THE HYDRANT EXTERIOR ABOVE GROUND LEVEL SHALL BE FIELD PAINTED WITH TWO COATS OF PAINT AS REQUIRED BY THE OWNER AFTER BACKFILLING IS COMPLETE.

BONNET, 3 CAPS AND CHAINS – BLACK ENAMEL, GLIDDEN 4551, ICI DEVOE #43089990, OR CITY APPROVED EQUAL.

BARREL – MEDIUM YELLOW ENAMEL, GLIDDEN 4560, ICI DEVOE #43088600, OR CITY APPROVED EQUAL.

PROTECTION AND PAINTING

ALL IRON PARTS OF VALVES AND ACCESSORIES SHALL BE PAINTED BEFORE LEAVING THE SHOP WITH TWO COATS OF ACCEPTABLE HIGH GRADE BITUMINOUS PAINT.

THE VALVES SHALL BE PROTECTED AT ALL TIMES FROM RUST OR DAMAGES, BOTH BEFORE AND AFTER INSTALLATION, UNTIL THE COMPLETION OF THE CONTRACT.

WATCH VALVES AND VALVE BOXES

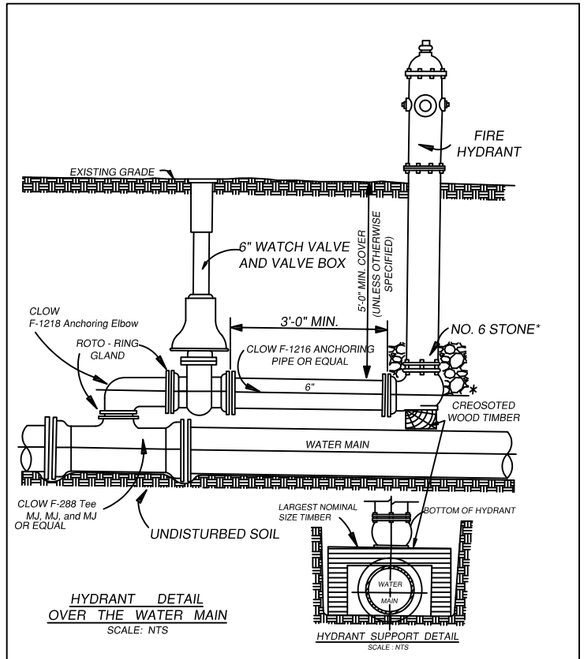
EACH HYDRANT SHALL BE CONTROLLED BY A WATCH VALVE WHICH SHALL BE A 6–INCH GATE VALVE AS PREVIOUSLY SPECIFIED, EXCEPT THE VALVES SHALL HAVE MECHANICAL JOINT ENDS FOR RECEIVING THE SPIGOT ENDS OF 6–INCH ANCHORING FITTINGS AND/OR ANCHORING PIPE. EACH VALVE SHALL BE INSTALLED COMPLETE WITH A VALVE BOX AS PREVIOUSLY SPECIFIED.

VALVE BOXES SHALL BE CONSTRUCTED OF A GOOD GRADE OF CAST IRON; SHALL BE COATED; SHALL BE OF THE THREE PIECE SCREW TYPE; SHALL HAVE A 5–1/4 INCH SHAFT; AND SHALL BE PROVIDED WITH A HEAVY NEAT FITTING COVER HAVING THE WORD "WATER" CAST ON THE TOP.

HYDRANT ANCHORING

EACH HYDRANT CONNECTION TO THE MAINS SHALL BE MADE BY MEANS OF ANCHORING PIPE AND ANCHORING FITTINGS AS SHOWN ON THE DETAILS HEREIN. ALL ANCHORING PIPE AND ANCHORING FITTINGS SHALL BE AS MANUFACTURED BY CLOW CORPORATION OR CITY APPROVED EQUAL.

ONLY THE CITY OF OREGON MAY OPERATE VALVES.

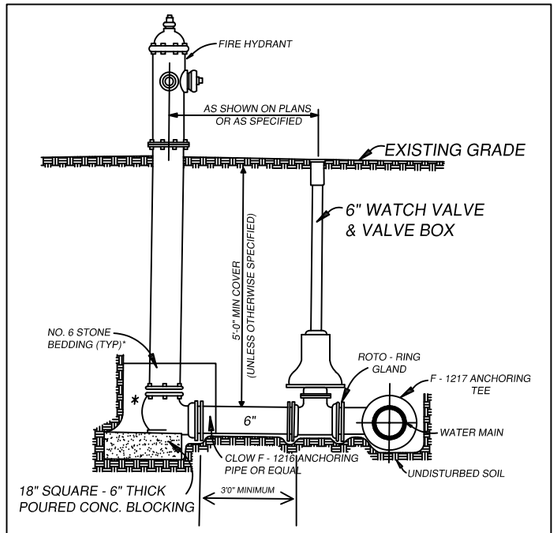


HYDRANT DETAIL OVER THE WATER MAIN
SCALE: NTS

HYDRANT SUPPORT DETAIL
SCALE : NTS

*PROVIDE NO. 6 STONE FOR DRAINAGE

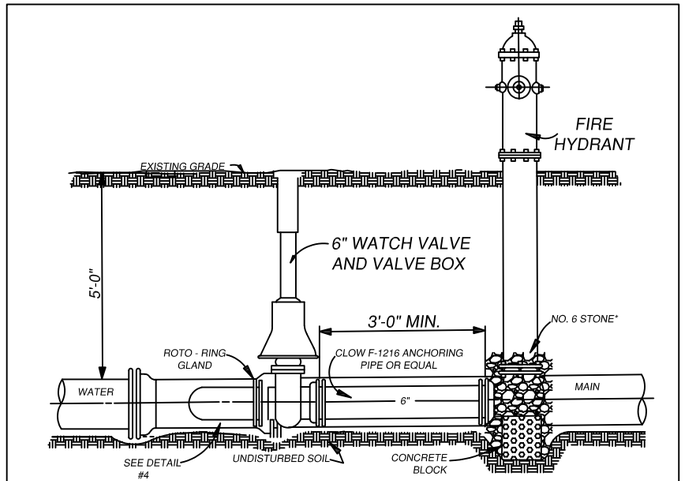
DETAIL 4
CITY OF OREGON STANDARD



HYDRANT DETAIL
OFFSET TO WATER MAIN
SCALE: NTS

*PROVIDE NO. 6 STONE FOR DRAINAGE

DETAIL 5
CITY OF OREGON STANDARD



HYDRANT DETAIL
PARALLEL TO WATER MAIN
SCALE: NTS

*PROVIDE NO. 6 STONE FOR DRAINAGE

DETAIL 6
CITY OF OREGON STANDARD

HYDRANT DETAILS

N.T.S.

THE PAY ITEM "FIRE HYDRANT AND VALVE ASSEMBLY" SHALL INCLUDE ALL MATERIAL, LABOR, EQUIPMENT, AND APPURTENANCES TO PROVIDE A COMPLETE WORKING FIRE HYDRANT AS DETAILED IN EITHER DETAIL 4, DETAIL 5, OR DETAIL 6. THE PAY ITEM SHALL BEGIN AT THE CONNECTION POINT WITH THE NEW WATER MAIN.

SCALE AS SHOWN
DRAWN A.L.B.
CHECKED
DATE 02/13/26

WATERLINE NOTES & DETAILS

CITY OF OREGON

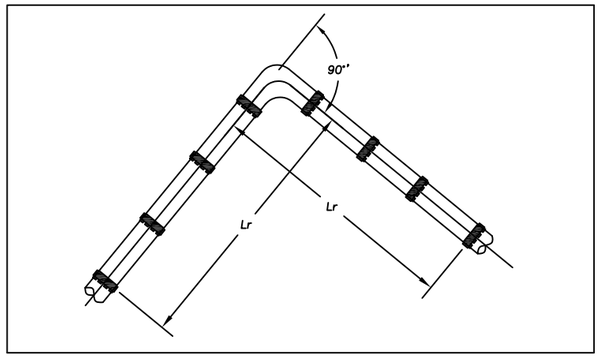


FIGURE 1. HORIZONTAL BEND

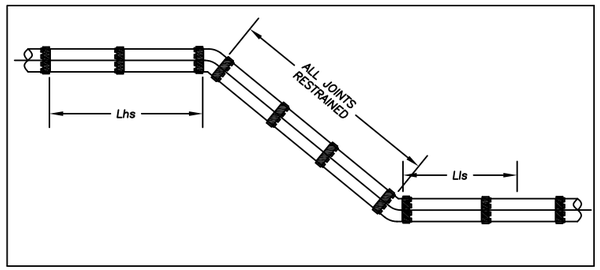


FIGURE 2. VERTICAL DOWN BEND AND OFFSET BEND

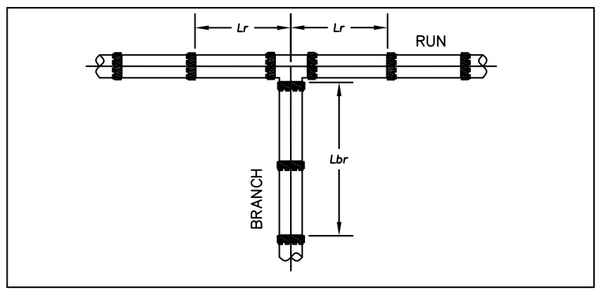


FIGURE 3. TEE

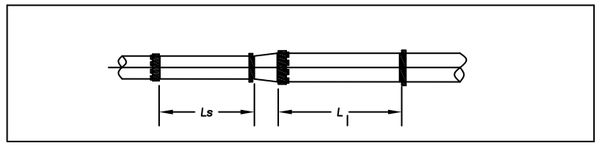


FIGURE 4. REDUCER

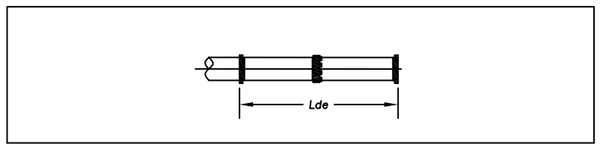


FIGURE 5. DEAD END

MINIMUM LENGTH OF PIPE RESTRAINED (FEET)

BRANCH SIZE	HORIZONTAL BENDS			VERTICAL BENDS				DEAD END
	90°	45°	22.5°	45°		22.5°		
	Lr	Lr	Lr	Lhs	Lls	Lhs	Lls	Lde
6"	20	8	4	18	6	9	3	44
8"	26	11	5	24	8	11	4	58
10"	32	13	6	29	10	14	5	69
12"	37	16	7	34	12	16	6	82
14"	43	18	9	39	13	19	6	94
16"	48	20	10	44	15	21	7	106
20"	59	24	12	53	19	26	9	129
24"	69	29	14	62	22	30	11	151

PVC PIPE

BRANCH SIZE	HORIZONTAL BENDS			VERTICAL BENDS				DEAD END
	90°	45°	22.5°	45°		22.5°		
	Lr	Lr	Lr	Lhs	Lls	Lhs	Lls	Lde
6"	21	9	4	12	6	6	3	28
8"	27	11	5	15	8	7	4	37
10"	33	14	7	18	10	9	5	44
12"	39	16	8	22	12	10	6	52
14"	44	18	9	25	13	12	6	60
16"	50	21	10	28	15	13	7	68
20"	61	25	12	34	18	16	9	82
24"	72	29	14	40	22	19	10	96

DUCTILE IRON

BRANCH SIZE	HORIZONTAL BENDS			VERTICAL BENDS				DEAD END
	90°	45°	22.5°	45°		22.5°		
	Lr	Lr	Lr	Lhs	Lls	Lhs	Lls	Lde
6"	36	15	7	28	11	14	5	68
8"	48	20	10	37	15	18	7	89
10"	57	24	11	44	18	21	9	107
12"	68	28	13	52	21	25	10	126
14"	78	32	15	60	24	29	12	144
16"	88	36	17	67	27	32	13	163
20"	107	44	21	82	33	39	16	198
24"	125	52	25	96	39	46	19	232

DUCTILE IRON W/ POLYETHYLENE WRAP

RUN SIZE

BRANCH SIZE (Lbr)	6"	8"	10"	12"	14"	16"	20"	24"
6"	*	*	*	*	*	*	*	*
8"	8	*	*	*	*	*	*	*
10"	30	18	5	*	*	*	*	*
12"	49	39	28	18	7	*	*	*
14"	66	57	1	39	30	20	1	*
16"	81	74	66	58	50	42	25	8
20"	110	104	97	91	85	78	65	51
24"	135	130	125	120	115	109	98	87

TEES
PVC PIPE
MINIMUM LENGTH OF PIPE RESTRAINED (FEET)(Lbr)

LARGE SIZE

REDUCTION SIZE (Ls/L1)	6"	8"	10"	12"	14"	16"	20"	24"
6"		32/24	70/43	117/60	172/75	236/89	387/116	570/140
8"			29/23	65/43	107/61	156/77	271/106	412/132
10"				29/24	62/44	101/63	193/95	306/123
12"					28/24	61/45	138/81	231/111
14"						28/24	93/64	173/98
16"							57/45	127/82
20"								55/45
24"								

REDUCERS
PVC PIPE
MINIMUM LENGTH OF PIPE RESTRAINED (L)(FEET)

RUN SIZE

BRANCH SIZE (Lbr)	6"	8"	10"	12"	14"	16"	20"	24"
6"	9	3	*	*	*	*	*	*
8"	22	18	13	8	3	*	*	*
10"	33	29	25	21	17	13	5	*
12"	42	39	36	33	30	26	20	13
14"	51	49	46	43	41	38	32	26
16"	60	58	56	53	51	48	43	38
20"	76	75	73	71	69	67	63	59
24"	91	90	88	87	85	84	80	77

TEES
DUCTILE IRON PIPE
MINIMUM LENGTH OF PIPE RESTRAINED (FEET)(Lbr)

LARGE SIZE

REDUCTION SIZE (Ls/L1)	6"	8"	10"	12"	14"	16"	20"	24"
6"		20/16	45/27	75/38	111/48	151/57	248/74	366/89
8"			19/15	42/28	69/39	100/49	174/68	264/84
10"				18/15	40/28	65/40	124/60	196/78
12"					18/15	39/29	88/51	148/71
14"						18/15	59/41	110/62
16"							37/29	81/52
20"								35/29
24"								

REDUCERS
DUCTILE IRON PIPE
MINIMUM LENGTH OF PIPE RESTRAINED (L)(FEET)

RUN SIZE

BRANCH SIZE (Lbr)	6"	8"	10"	12"	14"	16"	20"	24"
6"	21	7	*	*	*	*	*	*
8"	53	42	31	19	7	*	*	*
10"	79	70	60	51	42	32	12	*
12"	102	95	87	80	72	64	47	30
14"	124	118	111	105	98	91	77	63
16"	145	140	134	128	122	116	104	92
20"	184	180	175	171	166	161	152	142
24"	220	217	213	209	205	202	194	186

TEES
DUCTILE IRON PIPE W/POLYETHYLENE WRAP
MINIMUM LENGTH OF PIPE RESTRAINED (FEET)(Lbr)

LARGE SIZE

REDUCTION SIZE (Ls/L1)	6"	8"	10"	12"	14"	16"	20"	24"
6"		49/37	108/66	181/92	266/115	365/137	599/178	883/215
8"			45/36	101/67	166/94	241/119	419/163	637/203
10"				44/37	96/14	156/97	299/146	472/189
12"					43/37	93/69	212/124	356/171
14"						42/37	143/99	266/150
16"							88/70	195/126
20"								84/69
24"								

REDUCERS
DUCTILE IRON W/ POLYETHYLENE WRAP
MINIMUM LENGTH OF PIPE RESTRAINED (L)(FEET)

ONLY THE CITY OF OREGON MAY OPERATE VALVES.

Ls: IF A SPECIFIED LENGTH OF PIPE, Ls (FEET), ON THE SMALL SIDE OF THE REDUCER IS FREE OF BENDS, VALVES, TEES OR OTHER FITTINGS, RESTRAINTS ARE NOT NECESSARY FOR THE REDUCER; OTHERWISE THE LARGER SIDE OF THE REDUCER SHALL BE RESTRAINED THE MINIMUM LENGTH (L_1)(FEET).

SCALE AS SHOWN
DRAWN A.L.B.
CHECKED
DATE 02/13/26

WATERLINE DETAILS

CITY OF OREGON

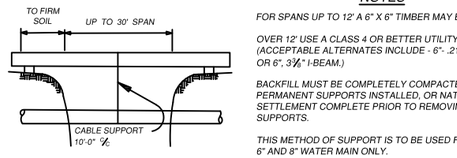
NOTES

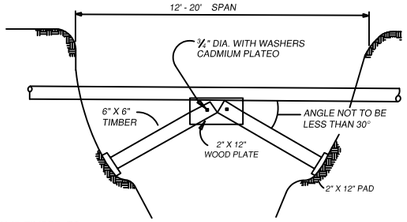
FOR SPANS UP TO 12' A 6" X 6" TIMBER MAY BE USED.

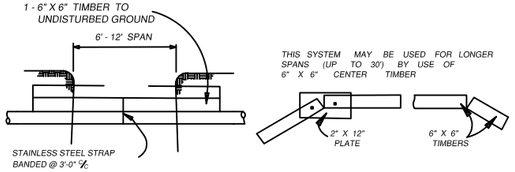
OVER 12' USE A CLASS 4 OR BETTER UTILITY POLE. (ACCEPTABLE ALTERNATES INCLUDE - 6" - .219" WALL PIPE OR 6", 3⅜" I-BEAM.)

BACKFILL MUST BE COMPLETELY COMPACTED, OR PERMANENT SUPPORTS INSTALLED, OR NATURAL SETTLEMENT COMPLETE PRIOR TO REMOVING EXPOSED SUPPORTS.

THIS METHOD OF SUPPORT IS TO BE USED FOR 6" AND 8" WATER MAIN ONLY.





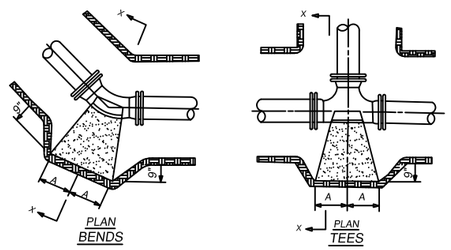


1- 6" X 6" TIMBER SUPPORT UP TO 8' SPAN.
2- 6" X 6" TIMBER SUPPORTS UP TO 12' SPAN.

SUPPORT OF UTILITIES PERPENDICULAR TO EXCAVATION

SCALE NTS

DETAIL 1
CITY OF OREGON STANDARD



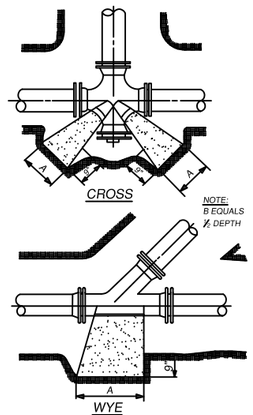
TYPE	SIZE	¼ BENDS		⅛ BENDS		1/16 BENDS		TEES		PLUGS	
		A	B	A	B	A	B	A	B	A	B
2000 PSF SOIL	6"	18"	11"	10"	11"	6"	9"	11"	13"	10"	24"
	8"	25"	14"	14"	14"	9"	11"	15"	17"	12"	32"
	10"	27"	20"	16"	19"	10"	15"	18"	22"	14"	40"
	12"	33"	23"	18"	23"	12"	18"	21"	26"	16"	47"
	14"	39"	26"	22"	26"	13"	22"	24"	30"	18"	54"
	16"	43"	30"	24"	30"	14"	26"	28"	33"	20"	61"
	20"	50"	39"	27"	39"	17"	32"	33"	42"	24"	74"
	24"	60"	45"	33"	45"	20"	38"	40"	49"	28"	88"

NOTE:
BASED ON 150 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.
ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.

FOR PIPING SMALLER THAN 6" USE BLOCKING DIMENSIONS FOR 6" PIPE.

Sheet 1 of 3

DETAIL 2
CITY OF OREGON STANDARD



TYPE	SIZE	CROSS		WYE	
		A	B	A	B
2000 PSF SOIL	6"	11"	13"	10"	12"
	8"	15"	17"	14"	14"
	10"	18"	22"	15"	20"
	12"	21"	26"	18"	23"
	14"	24"	30"	21"	27"
	16"	28"	33"	24"	30"
	20"	33"	42"	27"	43"
	24"	40"	49"	32"	50"

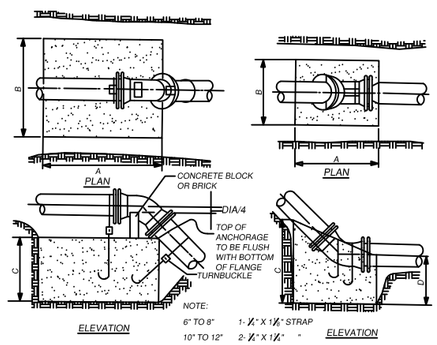
NOTE:
BASED ON 150 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.

ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.

FOR PIPING SMALLER THAN 6" USE BLOCKING DIMENSIONS FOR 6" PIPE.

Sheet 2 of 3

DETAIL 2
CITY OF OREGON STANDARD



NOTE:
6" TO 8" 1- ½" X 1½" STRAP
10" TO 12" 2- ½" X 1½" "
14" TO 16" 2- ⅝" X 1½" "
18" TO 20" 2- ½" X 1½" "

TYPE	SIZE	TYPE A			TYPE B			
		A	B	C	A	B	C	D
2000 PSF SOIL	6"	38"	32"	27"	27"	27"	27"	16"
	8"	44"	38"	27"	30"	30"	30"	18"
	10"	50"	44"	34"	37"	37"	33"	18"
	12"	57"	51"	40"	41"	41"	40"	21"
	14"	57"	51"	67"	47"	47"	47"	24"
	16"	64"	57"	67"	54"	54"	49"	24"
	20"	78"	63"	80"	64"	64"	64"	30"
	24"	93"	75"	83"	78"	78"	78"	36"

NOTE:
BASED ON 150 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.

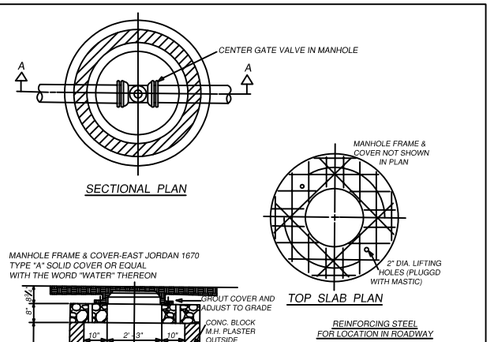
ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.

FOR PIPING SMALLER THAN 6" USE BLOCKING DIMENSIONS FOR 6" PIPE.

Sheet 3 of 3

DETAIL 2
CITY OF OREGON STANDARD

THRUST BLOCK DETAILS
N.T.S.

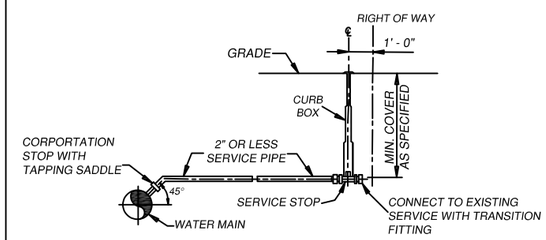


SECTION A-A

GATE VALVE IN MANHOLE

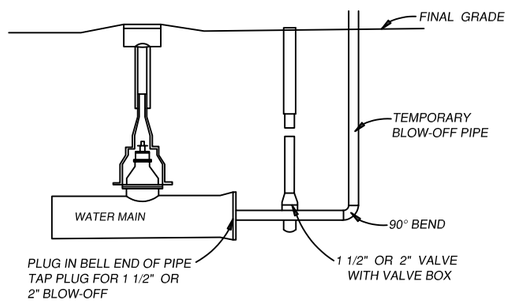
SCALE: NTS

DETAIL 3
CITY OF OREGON STANDARD



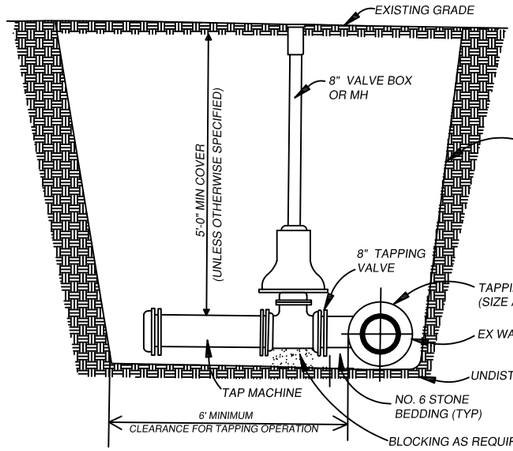
TWO INCH OR LESS SERVICE CONNECTION

NOT TO SCALE



STANDARD DETAIL FOR DEAD END WITH BLOW-OFF

NOT TO SCALE



TAPPING SLEEVE AND TAPPING VALVE DETAIL

SCALE: NTS

CITY OF OREGON STANDARD

BORING

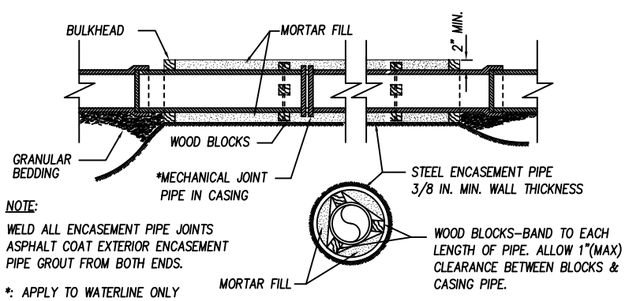
THE PIPE BORING SHALL BE INSTALLED BY FREE BORE, BORE AND JACK, DIRECTIONAL DRILLING, OR APPROVED METHOD. THE PIPE MATERIAL SHALL BE PER PLAN SPECIFICATIONS AND SHALL BE APPROVED BY THE MANUFACTURER FOR THE SELECTED BORING METHOD.

THE BORE AND JACK METHOD SHALL FOLLOW THE DETAIL BELOW.

WHERE REQUIRED, WATERLINE SHALL BE INSTALLED WITHIN STEEL ENCASEMENT PIPE MEETS ASTM A252. THE ENCASEMENT PIPE SHALL BE WELDED STEEL PIPE, OR CITY OF OREGON APPROVED EQUAL, AND SHALL BE ASPHALT COATED ON THE OUTSIDE. THE ENCASEMENT PIPE SHALL HAVE A MIN. TENSILE STRENGTH OF 60,000 P.S.I., A MINIMUM YIELD STRENGTH OF 35,000 P.S.I., AND A MIN. WALL THICKNESS OF 3/8 INCH. THE MINIMUM DIAMETER OF THE ENCASEMENT PIPE SHALL BE THE OUTSIDE THICKNESS OF 3/8 INCH. THE MINIMUM DIAMETER OF THE ENCASEMENT PIPE SHALL BE THE OUTSIDE DIAMETER OF THE BELL PLUS FOUR (4) INCHES, OR AS DIRECTED BY THE ENGINEER.

THE ENCASEMENT PIPE SHALL BE INSTALLED BY BORING AND JACKING AND IN—SUCH A MANNER SO AS TO ALLOW THE PIPE TO BE LAID AT THE PROPER GRADE.

THIS OPERATION SHALL BE CONTINUOUS (AROUND THE CLOCK UNTIL COMPLETE) AND CONDUCTED SO AS NOT TO INTERFERE WITH, INTERRUPT OR ENDANGER THE OPERATION OF TRAFFIC NOR DAMAGE, DESTROY, OR ENDANGER THE INTEGRITY OF THE ROADWAY FACILITIES.



NOTE:
WELD ALL ENCASEMENT PIPE JOINTS ASPHALT COAT EXTERIOR ENCASEMENT PIPE GROUT FROM BOTH ENDS.

*: APPLY TO WATERLINE ONLY

BORE AND JACK DETAIL

NOT TO SCALE

SCALE AS SHOWN
DRAWN A.L.B.
CHECKED PR
DATE 02/13/26

WATERLINE DETAILS

CITY OF OREGON

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