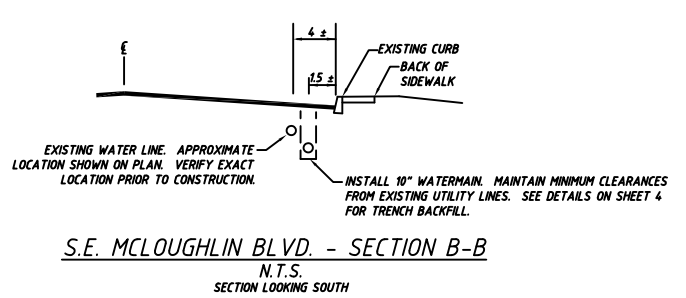
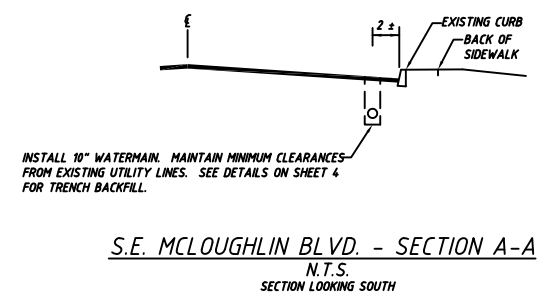
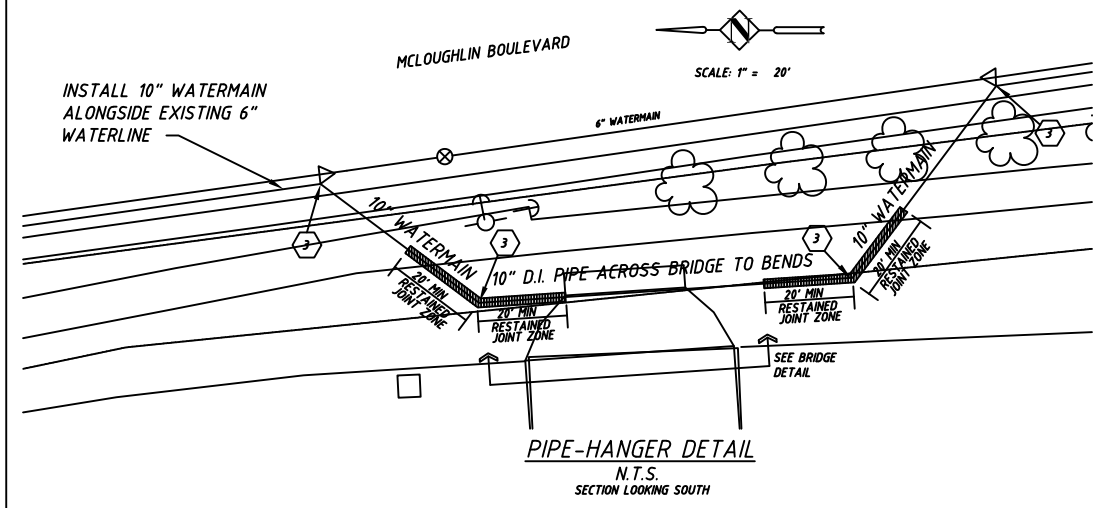
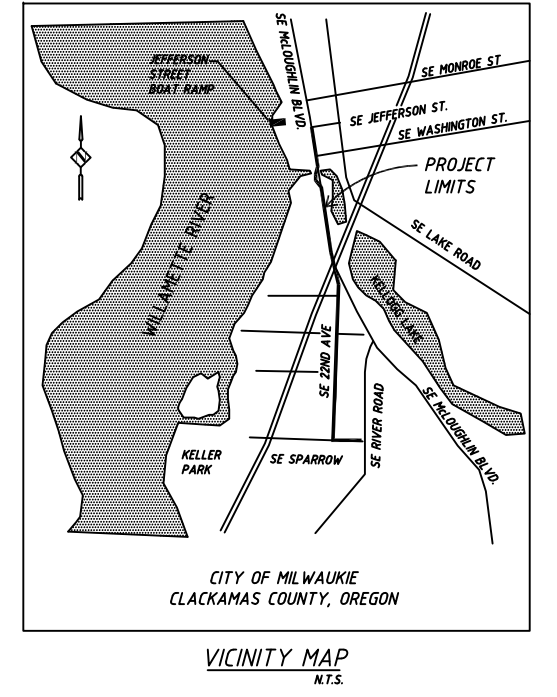


**LEGEND**

	EXISTING RIGHT-OF-WAY
	EXISTING EDGE OF PAVEMENT
	EXISTING FENCE
	EXISTING TELEPHONE LINE
	EXISTING SANITARY LINE
	EXISTING GAS LINE
	EXISTING STORM LINE
	EXISTING WATER LINE
	ABANDONED WATER LINE
	EXISTING WATER VALVE
	EXISTING WATER METER
	EXISTING UTILITY POLE
	EXISTING IRRIGATION VALVE/BOX
	EXISTING TREE(S)
	NEW WATERLINE
	WATER METER
	WATER VALVE
	THRUST BLOCK
	REDUCER
	BLOW-OFF
	END CAP
	FIRE HYDRANT ASSEMBLY
	RESTRAINED JOINTS
	BORING LOG



**PROJECT CONSTRUCTION NOTES**

ASSEMBLY REFERENCE NUMBER (#) AND DESCRIPTION
1 - 10" x 10" TAPPING SLEEVE, FLG. 1 - 10" TAPPING VALVE, FLG. x M.J. 1 - 10" 22 1/2" BEND 1 - VALVE BOX TOP WITH 5" PVC PIPE EXTENSION 2 - THRUST BLOCK
2 - UPON SATISFACTORY TESTING AND ACCEPTANCE OF NEW MAIN, CUT AND CAP EXISTING 6" WATERLINE WITH: 1 - 6" END CAP 1 - THRUST BLOCK
3 - 1 - 10", 45" BEND 1 - THRUST BLOCK (OR RESTRAINED JOINT IF INDICATED ON PLAN)
3A - 1 - STD. FIRE HYDRANT ASSEMBLY INCLUDING 10" x 6" TEE, M.J. x SIDE FLG. AND 6" G.V., FLG. x M.J. (LOCATE AS DIRECTED BY THE INSPECTOR)

\* NOTE: THE NO. OF LOCATIONS REFERS TO ONLY THE ITEMS IDENTIFIED WITH # AND DOES NOT INCLUDE ITEMS CALLED OUT INDEPENDENTLY ON THE PLAN.

NO.	DATE	BY	REVISIONS	CK'D	APP'VD

CITY OF MILWAUKIE  
PUBLIC WORKS DEPARTMENT  
6101 SE JOHNSON CREEK BLVD.  
MILWAUKIE, OREGON 97206  
TEL. (503) 786-7600  
FAX. (503) 774-8236

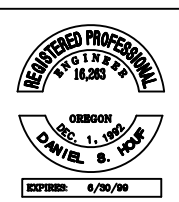
MILWAUKIE WATER DEPARTMENT

HRI JOB NO: MWK-01  
DESIGN NUMBER

WT-98-3  
PROJECT NUMBER

**Harper Righellis, Inc.**  
ENGINEERS

5200 NW MACHAM AVENUE, SUITE 500, PORTLAND, OR 97201  
(503) 221-1131 FAX (503) 221-1171



DESIGNED BY: DSH/NAW  
DRAWN BY: NAW  
CHECKED BY: DSH  
DATE: 3/26/98  
SCALE: 1"=50'

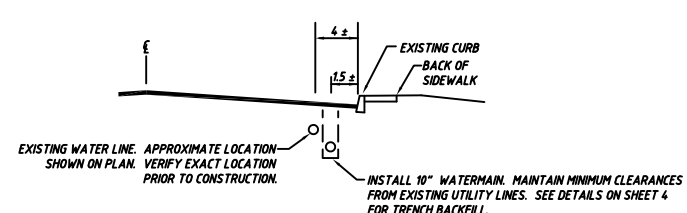
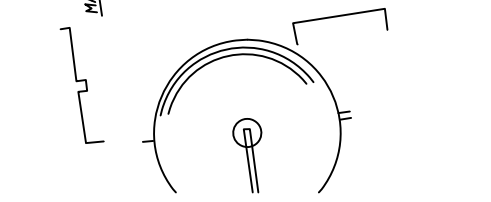
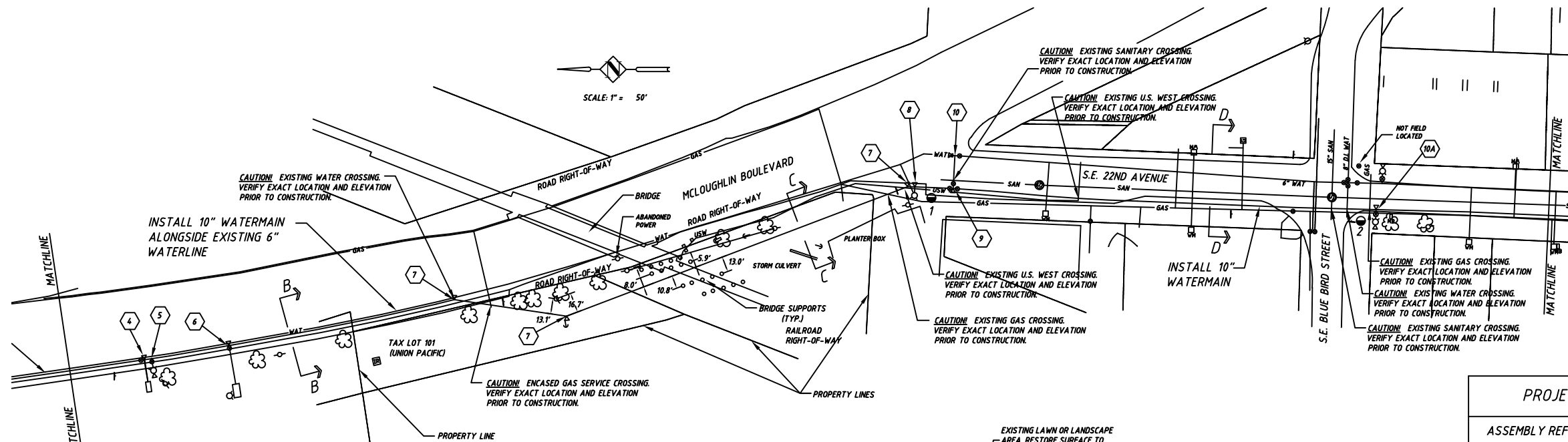
Mcloughlin Waterline Installation  
Jefferson Street - Sparrow Street

SUBMITTED BY: \_\_\_\_\_ PROJECT ENGINEER

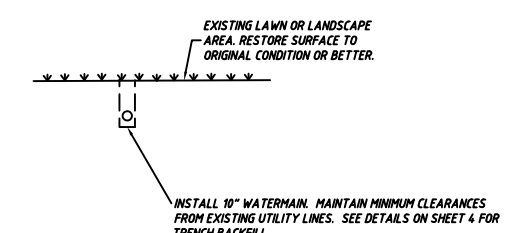
DRAWING NO. 1 OF 4

**LEGEND**

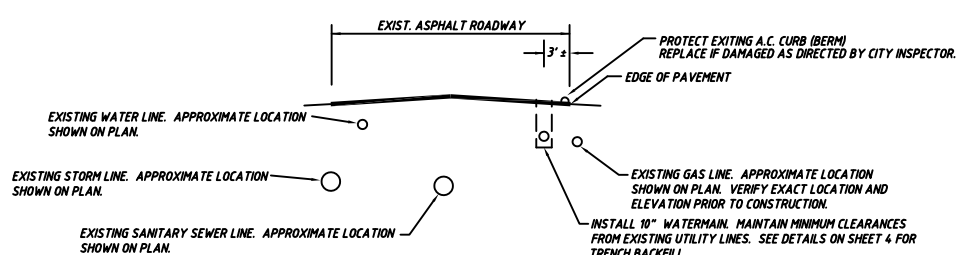
	EXISTING RIGHT-OF-WAY
	EXISTING EDGE OF PAVEMENT
	EXISTING FENCE
	EXISTING TELEPHONE LINE
	EXISTING SANITARY LINE
	EXISTING GAS LINE
	EXISTING STORM LINE
	EXISTING WATER LINE
	ABANDONED WATER LINE
	EXISTING WATER VALVE
	EXISTING WATER METER
	EXISTING UTILITY POLE
	EXISTING IRRIGATION VALVE/BOX
	EXISTING TREE(S)
	NEW WATERLINE
	WATER METER
	WATER VALVE
	THRUST BLOCK
	REDUCER
	BLOW-OFF
	END CAP
	FIRE HYDRANT ASSEMBLY
	RESTRAINED JOINTS
	BORING LOG



**S.E. MCGLOUGHLIN BLVD. - SECTION B-B**  
N.T.S.  
SECTION LOOKING SOUTH



**S.E. 22ND AVENUE - SECTION C-C**  
N.T.S.  
SECTION LOOKING SOUTH



**S.E. 22ND AVENUE - SECTION D-D**  
N.T.S.  
SECTION LOOKING SOUTH

**CAUTION!** VERIFY LOCATIONS AND DEPTHS OF SERVICE LATERALS (WATER, SANITARY, GAS, ETC.) IN ADVANCE OF NEW WATER LINE INSTALLATION TO ALLOW FOR ANY REQUIRED ADJUSTMENTS.

**PROJECT CONSTRUCTION NOTES**

ASSEMBLY REFERENCE NUMBER (#) AND DESCRIPTION
4 UPON SATISFACTORY TESTING AND ACCEPTANCE OF NEW MAIN, TRANSFER EXISTING WATER METER VAULT LINE TO NEW CONNECTION. 1-10" G.V. NORTH OF CONNECTION POINT
5 UPON SATISFACTORY TESTING AND ACCEPTANCE OF NEW MAIN, TRANSFER EXISTING FIRE HYDRANT TO NEW CONNECTION. RETAIN EXISTING FIRE HYDRANT AND CONNECT TO NEW 10" MAIN. INSPECTOR SHALL DETERMINE ACCEPTABILITY OF EXISTING THRUST BLOCKING FOR HYDRANT TO BE RETAINED. CONTRACTOR TO POT-HOLE TO VERIFY BLOCKING AS DIRECTED BY ENGINEER.
6 UPON SATISFACTORY TESTING AND ACCEPTANCE OF NEW MAIN, TRANSFER EXISTING FIRE LINE TO NEW CONNECTION. INSTALL CONCRETE THRUST BLOCK.
7 1- 10", 22-1/2" BEND 1- THRUST BLOCK
8 RECONNECT EXISTING HYDRANT TO NEW 10" WATERLINE WITH: 1- 10" x 6" TEE, M.J. x SIDE FLG. 1- 6" G.V., FLG. x M.J. 1- VALVE BOX TOP WITH 5" PVC PIPE EXTENSION 1- THRUST BLOCK RETAIN EXISTING HYDRANT AND ROTATE HYDRANT AS REQUIRED. INSPECTOR SHALL DETERMINE ACCEPTABILITY OF EXISTING THRUST BLOCKING FOR HYDRANT TO BE RETAINED. CONTRACTOR TO POT-HOLE TO VERIFY BLOCKING AS DIRECTED BY ENGINEER.
9 1- 10" x 6" TEE, FLG. 1- 6" G.V., FLG. x M.J. 30 L.F. OF 6" PIPE 2- 10" G.V., FLG. x M.J. 3- VALVE BOX TOP WITH 5" PVC PIPE EXTENSION 1- THRUST BLOCK
10 UPON SATISFACTORY TESTING AND ACCEPTANCE OF NEW MAIN, CUT AND ABANDON EXISTING 6" WATERLINE TO NORTH. CONNECT EXISTING WATERLINE TO SOUTH WITH NEW 10" WATERLINE WITH: 1- 6" ELBOW, M.J. 1- THRUST BLOCK PLUG ABANDONED LINE TO NORTH.
10A 1- STD. FIRE HYDRANT ASSEMBLY INCLUDING 10" x 6" TEE, M.J. x SIDE FLG. AND 6" G.V., FLG. x M.J. (LOCATE AS DIRECTED BY THE INSPECTOR)

\* NOTE: THE NO. OF LOCATIONS REFERS TO ONLY THE ITEMS IDENTIFIED WITH # AND DOES NOT INCLUDE ITEMS CALLED OUT INDEPENDENTLY ON THE PLAN.

ROCK DEPTH - BASED ON EXPLORATIONS BY CARLSON TESTING, INC.

BORING LOG NUMBER	ROCK DEPTH
1	8 FEET
2	8 FEET

NO.	DATE	BY	REVISIONS	CK'D	APP'VD

CITY OF MILWAUKIE  
PUBLIC WORKS DEPARTMENT  
6101 SE JOHNSON CREEK BLVD.  
MILWAUKIE, OREGON 97206  
TEL. (503) 786-7600  
FAX. (503) 774-8236

MILWAUKIE WATER DEPARTMENT

MWK-01  
DESIGN NUMBER

WT-98-3  
PROJECT NUMBER

**Harper Righellis, Inc.**  
ENGINEERS

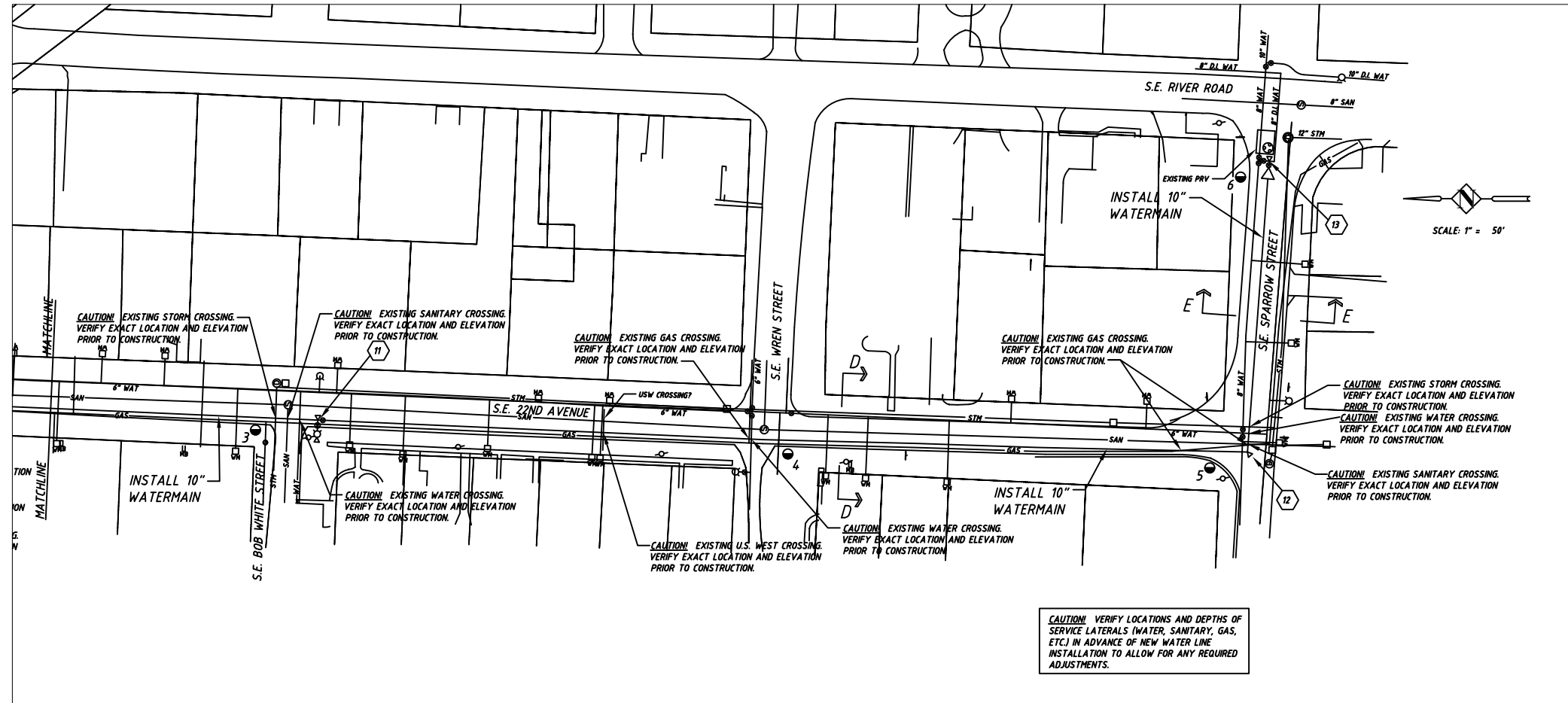
5200 SW MACHON AVENUE, SUITE 500, PORTLAND, OR 97201  
(503) 221-1131 FAX (503) 221-1171

REGISTERED PROFESSIONAL ENGINEER  
NO. 16,283  
OREGON  
DEC. 1, 1989  
DANIEL B. HAUF  
EXPIRES: 6/30/99

DESIGNED BY DSH  
DRAWN BY NAW  
CHECKED BY DSH  
DATE 3/26/98  
SCALE 1"=50'

MCGLOUGHLIN WATERMAIN INSTALLATION  
JEFFERSON STREET - SPARROW STREET

SUBMITTED BY PROJECT ENGINEER  
DRAWING NO. 2 OF 4



**LEGEND**

	EXISTING RIGHT-OF-WAY
	EXISTING EDGE OF PAVEMENT
	EXISTING FENCE
	EXISTING TELEPHONE LINE
	EXISTING SANITARY LINE
	EXISTING GAS LINE
	EXISTING STORM LINE
	EXISTING WATER LINE
	ABANDONED WATER LINE
	EXISTING WATER VALVE
	EXISTING WATER METER
	EXISTING UTILITY POLE
	EXISTING IRRIGATION VALVE/BOX
	EXISTING TREE(S)
	NEW WATERLINE
	WATER METER
	WATER VALVE
	THRUST BLOCK
	REDUCER
	BLOW-OFF
	END CAP
	FIRE HYDRANT ASSEMBLY
	RESTRAINED JOINTS
	BORING LOG

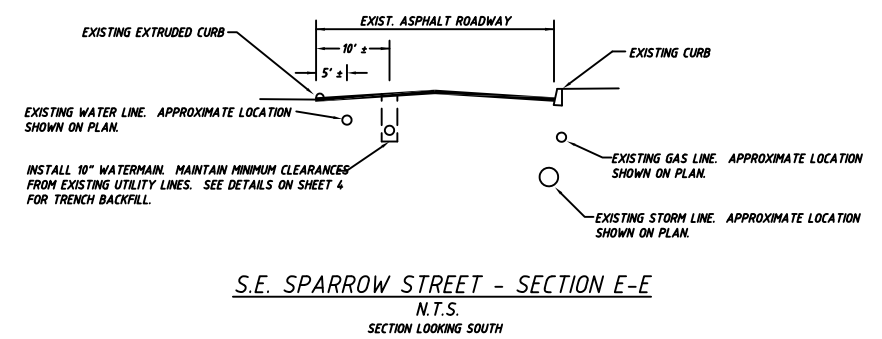
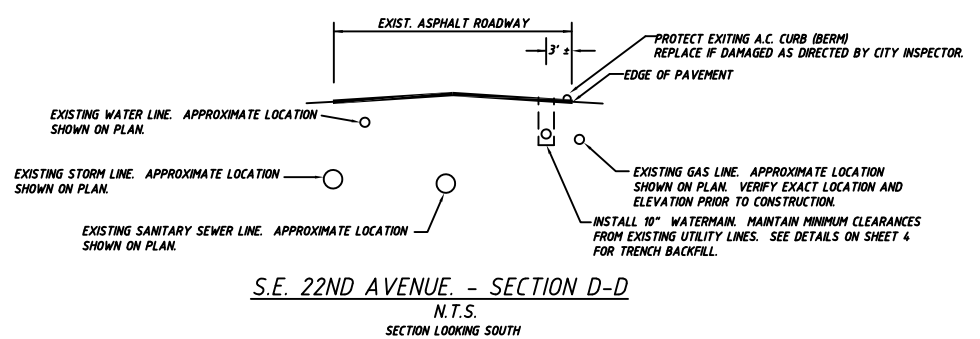
**CAUTION:** VERIFY LOCATIONS AND DEPTHS OF SERVICE LATERALS (WATER, SANITARY, GAS, ETC.) IN ADVANCE OF NEW WATER LINE INSTALLATION TO ALLOW FOR ANY REQUIRED ADJUSTMENTS.

**PROJECT CONSTRUCTION NOTES**

**ASSEMBLY REFERENCE NUMBER (#) AND DESCRIPTION**

#11	1 - STD. FIRE HYDRANT ASSEMBLY INCLUDING 10" x 6" TEE, FLG. AND 6" G.V., FLG. x M.J. 1 - 10" G.V., FLG. x M.J. 1 - 10" ADAPTER FLG. x M.J. (LOCATE AS DIRECTED BY THE INSPECTOR)
#12	1 - 10" 90 ELBOW 1 - THRUST BLOCK
#13	UPON SATISFACTORY TESTING AND ACCEPTANCE OF NEW MAIN, CONNECT EXISTING 8" D.I. WATERMAIN TO NEW 10" WATERLINE WITH: 1 - 8" x 8" TAPPING SLEEVE, FLG. 1 - 8" TAPPING VALVE, FLG. x M.J. 1 - 8" x 10" REDUCER 1 - VALVE BOX TOP WITH 5" PVC PIPE EXTENSION 1 - THRUST BLOCK CONNECT BEFORE TESTING AND TEST AGAINST G.V.

\* NOTE: THE NO. OF LOCATIONS REFERS TO ONLY THE ITEMS IDENTIFIED WITH (#) AND DOES NOT INCLUDE ITEMS CALLED OUT INDEPENDENTLY ON THE PLAN.



ROCK DEPTH - BASED ON EXPLORATIONS BY CARLSON TESTING, INC.

BORING LOG NUMBER	ROCK DEPTH
3	3 FEET
4	8 FEET
5	6 FEET
6	6 FEET

NO.	DATE	BY	REVISIONS	CK'D	APP'VD

CITY OF MILWAUKIE  
PUBLIC WORKS DEPARTMENT  
6101 SE JOHNSON CREEK BLVD.  
MILWAUKIE, OREGON 97206  
TEL. (503) 786-7600  
FAX. (503) 774-8236

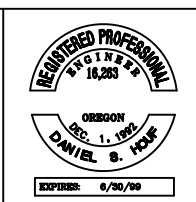
MILWAUKIE WATER DEPARTMENT

MWK-01  
DESIGN NUMBER

WT-98-3  
PROJECT NUMBER

**Harper Righellis, Inc.**  
ENGINEERS

5200 SW MICHIGAN AVENUE, SUITE 500, PORTLAND, OR 97201  
(503) 221-1131 FAX (503) 221-1171



DESIGNED BY: DSH  
DRAWN BY: NAW  
CHECKED BY: DSH  
DATE: 3/26/98  
SCALE: 1"=50'

MCLOUGHLIN WATERMAIN INSTALLATION  
JEFFERSON STREET - SPARROW STREET

SUBMITTED BY: \_\_\_\_\_ PROJECT ENGINEER

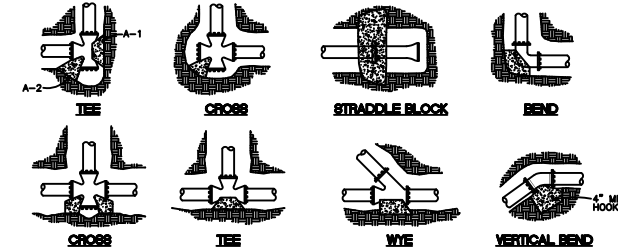
DRAWING NO. 3 OF 4

FITTING SIZE	(HORIZONTAL) BEARING AREA OF THRUST BLOCKS IN SQUARE FEET					(VERTICAL) VOLUME OF THRUST BLOCK IN CUBIC YARDS					
	TEE, WYE, DEAD END AND HYDRANT	STRADDLE BLOCK	90° BEND	TEE PLUGGED ON RUN	45° BEND	22-1/2° BEND	11-1/4° BEND	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4	1.0	1.6	1.4	1.9	1.4	1.0	---	---	---	---	---
6	2.1	3.7	3.0	4.3	3.0	1.8	1.0	1.3	---	---	---
8	3.8	6.5	5.3	7.6	5.4	2.9	1.5	2.3	1.1	---	---
10	5.9	10.2	8.4	11.8	8.4	4.6	2.4	3.7	1.8	---	---
12	8.5	14.7	12.0	17.0	12.0	6.6	3.4	5.5	2.8	1.2	---
14	11.5	---	16.3	23.0	16.3	8.9	4.8	7.8	3.9	1.7	---
16	15.0	26.1	21.3	30.0	21.3	11.8	6.0	9.9	5.1	2.3	0.9
18	19.0	---	27.0	38.0	27.0	14.6	7.8	12.8	6.8	---	---
20	23.5	40.8	33.3	47.0	33.3	18.1	9.4	16.7	8.8	---	---
24	34.0	58.8	48.0	68.0	48.0	26.2	13.6	24.8	13.6	---	---

NOTES:  
 1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:  

$$\text{BEARING AREA} = (\text{TEST PRESSURE} / 150) \times (2000 / \text{SOIL BEARING STRESS}) \times (\text{TABLE VALUE})$$
  
 2. ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 POUNDS PER CUBIC YARD. TO COMPUTE FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:  

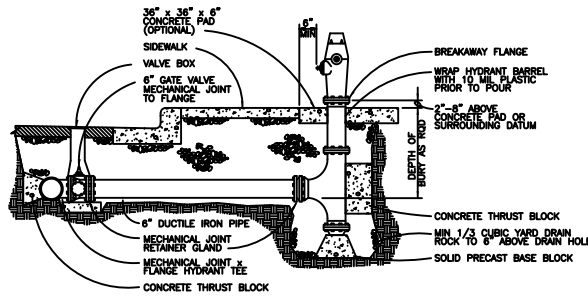
$$\text{VOLUME} = (\text{TEST PRESSURE} / 150) \times (\text{TABLE VALUE})$$



RODS FOR VERTICAL BENDS		
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#6	30"
14"-18"	#8	36"

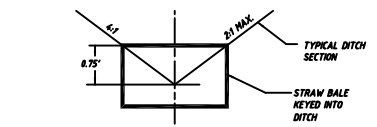
- NOTES:  
 1. CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.  
 2. ALL CONCRETE TO BE CLASS 2400 MINIMUM.  
 3. INSTALL ISOLATION MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING CONCRETE BLOCKING.  
 4. CONCRETE SHALL BE KEPT CLEAR OF ALL JOINTS AND ACCESSORIES.  
 5. THE RODS SHALL BE DEFORMED GALVANIZED COLD ROLLED STEEL, 40000 PSI TENSILE STRENGTH.

**THRUST BLOCKING**

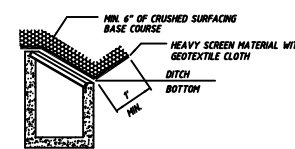


- NOTES:  
 1. WHEN PIPE IS SHORTER THAN 18", NO JOINTS ALLOWED. USE MECHANICAL JOINT RETAINER GLANDS. TWO 3/4" GALVANIZED THE RODS MAY BE USED IN LIEU OF THRUST BLOCKS FOR INSTALLATIONS LESS THAN 18". THE RODS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.  
 2. WHEN PIPE IS LONGER THAN 18", RETAINER GLANDS NOT REQUIRED.  
 3. THERE SHALL BE A MINIMUM OF 18" HORIZONTAL CLEARANCE AROUND HYDRANT.  
 4. WHEN PLACED ADJACENT TO CURB, HYDRANT PORT SHALL BE 24" FROM FACE OF CURB.  
 5. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AS PER THRUST BLOCK STANDARD DRAWING. DO NOT BLOCK DRAIN HOLES.  
 6. EXTENSIONS REQUIRED FOR HYDRANT SYSTEMS SHALL BE INSTALLED TO THE MANUFACTURER'S SPECIFICATIONS.  
 7. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, POLES, AND OTHER OBSTRUCTIONS.  
 8. HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS.

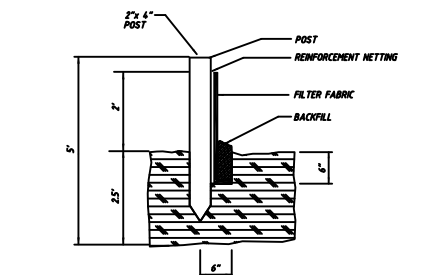
**HYDRANT INSTALLATION**



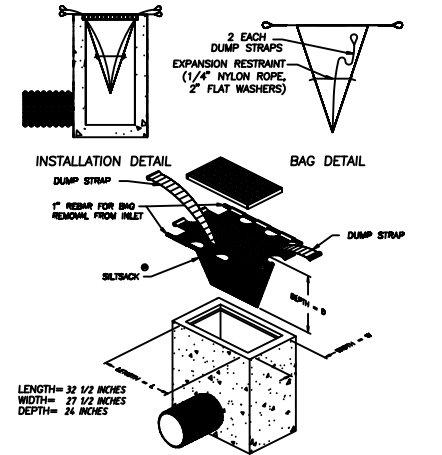
**STRAW BALE INSTALLATION IN DITCH**



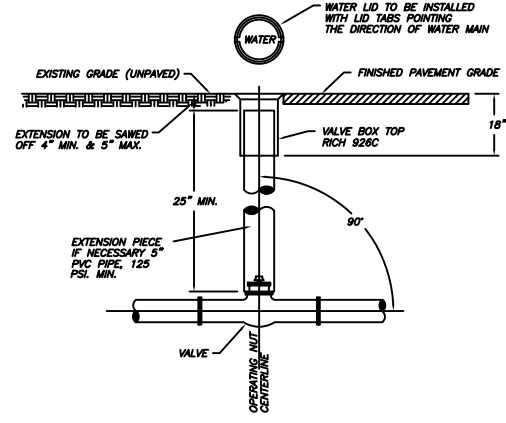
**DITCH INLET PROTECTION**



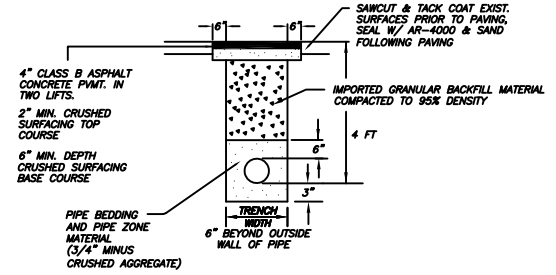
**SILT FENCE INSTALLATION**



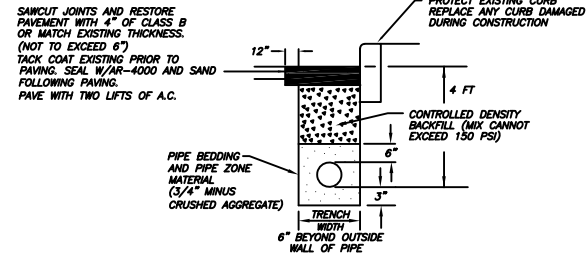
**FILTER BAG INLET PROTECTION**



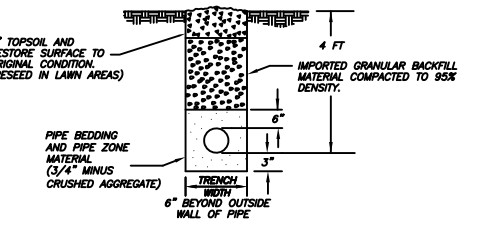
**STANDARD VALVE BOX**



**S.E. 22ND AVENUE AND S.E. SPARROW AVENUE**



**S.E. McLOUGHLIN BOULEVARD (WITHIN ROADWAY)**



**ROAD SHOULDERS, LANDSCAPE AREAS, SIDEWALK AREAS**

**GENERAL NOTES:**

- ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CITY OF MILWAUKIE WATER CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS.
- A WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTRACTOR TO SCHEDULE WORK ACCORDINGLY.
- THE LOCATIONS OF ALL EXISTING UTILITIES ARE FOR INFORMATIONAL PURPOSES ONLY. MANY LOCATIONS ARE AS PER SCHEMATIC RECORD DRAWINGS. THE CURRENT AND EXACT LOCATIONS OF FACILITIES MUST BE VERIFIED PRIOR TO CONSTRUCTION. THE CONTRACTOR PERFORMING THE WORK SHALL COMPLY WITH THE PROVISIONS OF O.R.S. 757.541 TO 757.571 INCLUDING NOTIFICATION OF ALL OWNERS OF UNDERGROUND FACILITIES AT LEAST 48 BUSINESS DAY HOURS PRIOR TO EXCAVATION. CALL 246-6699 FOR UTILITY LOCATE SERVICE.
- WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM WITH OREGON DEPARTMENT OF TRANSPORTATION PERMIT REQUIREMENTS AND DETAILS.
- WATERMANS BEING INSTALLED NEAR TELEPHONE COMMUNICATIONS SHALL HAVE A MINIMUM 12" HORIZONTAL AND 6" VERTICAL CLEARANCE.
- WATERMANS BEING INSTALLED NEAR UNDERGROUND POWER LINES SHALL HAVE A MINIMUM 12" HORIZONTAL AND 6" VERTICAL CLEARANCE.
- INSTALL WATERMAIN WITH 3.0 FEET OF MINIMUM COVER UNLESS OTHERWISE NOTED. DEPTH MAY INCREASE AT UTILITY AND CULVERT CROSSINGS.
- SIGNS AND MAILBOXES THAT ARE DISTURBED BY CONSTRUCTION SHALL BE RELOCATED BACK FROM EDGE OF PAVEMENT, 10 FEET CLEAR OF WATERMAIN. ANY SIGNS OR MAILBOXES DAMAGED SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE INSPECTOR.
- THE CONTRACTOR SHALL FIELD VERIFY LOCATION, SIZE, AND CONDITION OF ALL EXISTING CULVERTS WHICH MAY BE IMPACTED BY CONSTRUCTION ACTIVITIES. ALL CULVERTS WHICH ARE DISTURBED BY CONSTRUCTION SHALL BE RESTORED AS DIRECTED BY THE INSPECTOR.
- DRIVEWAYS DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION.
- ALL WATER SERVICES, BLOW-OFF ASSEMBLIES, AIR RELEASE VALVES, FIRE HYDRANT ASSEMBLIES, VALVE BOXES, AND THRUST BLOCKING SHALL BE INSTALLED AS PER THE STANDARD SPECIFICATIONS AND DETAILS.
- ACTUAL ROAD ALIGNMENTS MAY VARY FROM RIGHT-OF-WAY INDICATED. THE RIGHT-OF-WAY INDICATED IS AS PER COUNTY ASSESSOR MAPS. THE CONTRACTOR SHALL VERIFY THE PROPOSED PIPE ALIGNMENT AND REPORT DIFFERENCES TO THE INSPECTOR. ALL ALIGNMENT CHANGES MUST BE APPROVED BY THE INSPECTOR PRIOR TO INSTALLATION.
- A TAPPING COMPANY APPROVED BY THE CITY OF MILWAUKIE SHALL BE USED TO MAKE ALL TAPS.
- THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS.
- REQUIRED SEPARATION BETWEEN WATER LINES AND SANITARY SEWER LINES SHALL BE AS FOLLOWS:

**VERTICAL SEPARATION (PERPENDICULAR)**  
 WATER LINES CROSSING SANITARY SEWER LINES SHALL BE LAID ABOVE THE SEWER LINES TO PROVIDE A SEPARATION OF AT LEAST 18 INCHES BETWEEN THE INVERT OF THE WATER PIPE AND THE CROWN OF THE SANITARY SEWER PIPE. A LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING AND SHALL BE THE LONGEST STANDARD LENGTH AVAILABLE FROM THE MANUFACTURER.

**GENERAL EROSION CONTROL NOTES**

- SEED ALL DISTURBED GROUND AREAS.
- WHEN EXCAVATION OCCURS IN ROADSIDE DITCHES, EXCAVATE AND KEY INTO DITCH ONE STRAW BALE PER 100' OF DITCH, OR WHERE NOTED ON THE PLANS. REMOVE SILT WHEN IT IS EVEN WITH THE TOP OF THE BALE. REPLACE OR ADD BALES AS NECESSARY TO PROPERLY FILTER THE STORM WATER.
- INSTALL HEAVY SCREEN MATERIAL AND GEOTEXTILE CLOTH OVER GRATE ON DITCH INLETS AND COVER WITH A MINIMUM 6 INCHES OF CRUSHED SURFACING BASE COURSE. REMOVE AND REPLACE GEOTEXTILE AND ROCK WHEN THE SILT BECOMES GREATER THAN HALF THE HEIGHT OF THE DITCH INLET. AT COMPLETION OF PROJECT REMOVE ALL SILT FROM DITCHES AND REMOVE MATERIAL COVERING DITCH INLETS AND GRATES.
- INSTALL SACKS (FILTER BAGS) AT EACH CURB INLET OR CATCH BASIN. REMOVE SILT AND ADD BIOFILTER BAGS/STRAW BALES AS NECESSARY TO PROPERLY FILTER THE STORM WATER.

NO.	DATE	BY	REVISIONS	CK'D	APP'VD

CITY OF MILWAUKIE  
 PUBLIC WORKS DEPARTMENT  
 6101 SE JOHNSON CREEK BLVD.  
 MILWAUKIE, OREGON 97206  
 TEL. (503) 786-7600  
 FAX. (503) 774-8236

MILWAUKIE WATER DEPARTMENT

MWK-01  
 DESIGN NUMBER

WT-98-3  
 PROJECT NUMBER

**Harper Righellis, Inc.**  
 ENGINEERS

5200 SW MICHIGAN AVENUE, SUITE 500, PORTLAND, OR 97201  
 (503) 221-1131 FAX (503) 221-1171

REGISTERED PROFESSIONAL ENGINEER  
 16,283  
 OREGON  
 DEC. 1, 1988  
 DANIEL S. HAUF  
 EXPIRES: 6/30/99

DESIGNED BY: DSH  
 DRAWN BY: NAW  
 CHECKED BY: DSH  
 DATE: 3/26/98  
 SCALE: 1"=50'

McLOUGHLIN WATERMAIN INSTALLATION  
 GENERAL NOTES/DETAIL SHEET

SUBMITTED BY: PROJECT ENGINEER  
 DRAWING NO.: 4 OF 4