CITY OF TIGARD
OR99W:GAARDE\MCDONALD
WATERLINE CROSSING

JANUARY 2015

INDEX OF DRAWINGS

GENERAL

CIVIL

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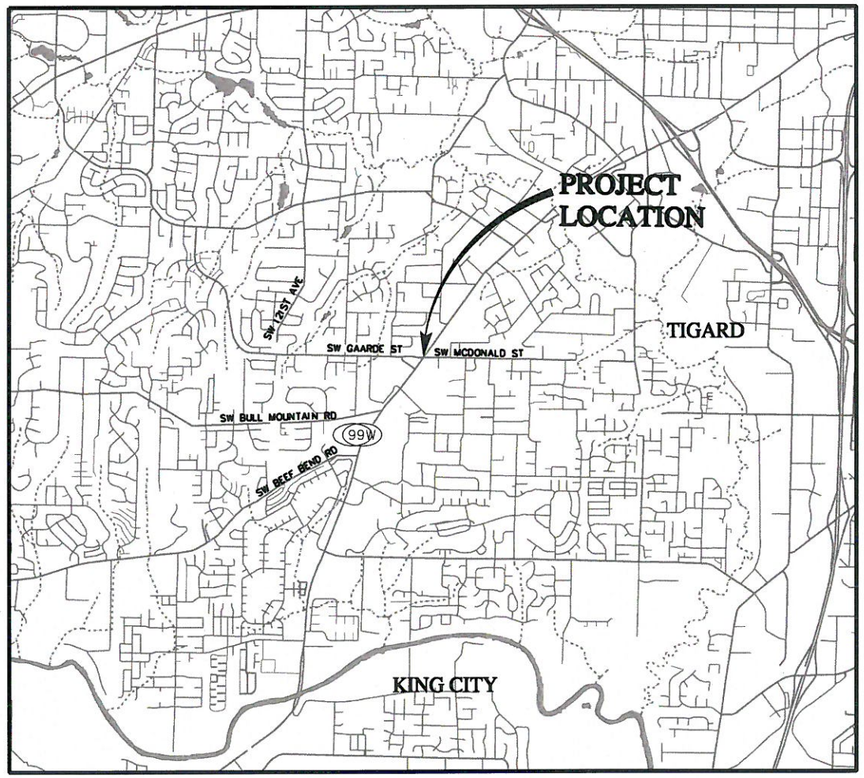
ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THERULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6899.)



N

LOCATION MAP
SCALE: 1"=1,000'

14-1595.0202

GENERAL WATERLINE CONSTRUCTION NOTES:

WN-1. Locations and grades of existing utilities are based on information provided by the utilities and are shown for informational purposes only. Oregon law requires contractor to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. The contractor shall have utilities located in accordance with ORS 757.541 through 757.571 prior to commencing construction. Contractor shall also field verify depths of existing utilities to identify potential conflicts and as required for connections to existing systems.

WN-2. The contractor shall pothole and verify locations, elevations, types and sizes of all existing utilities prior to constructing new piping. Potholing shall sufficiently precede laying of pipe to allow required elevation adjustments to be accomplished without rework. Elevation adjustments shall be expected and are incidental to the work. Deflect pipe as required and within 80% of manufacturer's tolerances to avoid existing utilities and to complete tie-ins.

WN-3. Unless noted on the plans or specified otherwise, all construction is to be performed in accordance with the most recent version of City of Tigard standards, Oregon APWA standard specifications and the Oregon Administration Rules (OAR), chapter 333.

WN-4. The engineer may, at their discretion, require tests and/or reports from the contractor to validate claims of material or construction adequacy/compliance. Such test/reports shall be provided at the contractor's expense.

WN-5. The contractor shall provide "As Constructed" drawings indicating all changes in grade, alignment, fittings and materials installed and any other utilities or obstacles not so indicated on these plans.

WN-6. At the end of each work day all trenches shall be backfilled and all trenches within streets shall be temporarily paved or covered to the satisfaction of the engineer. Temporary hard-surface patch as specified shall be placed on trenches within roadways at the end of each day's work, unless otherwise directed. No trench, on-site or off-site, shall be left at any time in an unsafe condition. The contractor is responsible for and is liable for hazards or damage resulting from the prosecution of the work.

WN-7. Utilities or interfering portions of utilities that are abandoned in place shall be removed by the contractor to the extent necessary to accomplish the work. The contractor shall seal and cap the remaining exposed ends of abandoned utilities with non-shrink grout to 1 foot length into pipe and fill if required by the specifications.

WN-8. Operation of all valves shall be performed by authorized City of Tigard personnel only.

WN-9. Connections to existing waterlines may require temporary shutdowns of existing facilities. The contractor shall coordinate this work with the affected utility and request shutdowns a minimum of 5 working days in advance of desired timing of connection work. Contractor shall not assume shutdown times, but rather schedule and coordinate shutdowns with affected utility.

WN-10. All proposed mains and appurtenances shall be pressure tested in accordance with City of Tigard requirements. minimum test pressure is 150 psi.

WN-11. All proposed mains and appurtenances shall be disinfected in accordance with AWWA standard C651-latest revision, the state health division and City of Tigard requirements. Bacteriological tests will be taken by City of Tigard personnel.

WN-12. The contractor shall dispose of the disinfection water in an approved manner. Do not allow disinfection water to flow into a waterway without adequate dilution or other satisfactory methods of reducing chlorine residuals to a safe level as mandated by DEQ.

WN-13. Contractor shall provide temporary taps and blow-offs as required to facilitate flushing, testing, and disinfection of new waterlines. Upon acceptance of proposed waterline and services, remove and replace temporary test taps with permanent plugs and remove temporary blow-offs and complete tie-ins.

WN-14. The use of concrete thrust blocks is allowed only where shown on plans. All pipe and fitting joints shall be restrained with approved joint restraint system.

WN-15. See specifications for types of manufacturer's proprietary restraint systems allowed.

WN-16. All gaskets on buried piping shall be Nitrile rubber. All flanged connections to be provided with full-face Nitrile gaskets as specified.

WN-17. Provide polyethylene encasement for all piping within 10 feet of existing gas main according to ANSI/AWWA C102/A21.5.

WN-18. Comply with OAR chapter 333 rules for required waterline-sewerline separation and crossing requirements. Each crossing shall be made such that a full 20 foot length of new sewer pipe as specified is centered across a full length (18 feet-20 feet) of waterline piping unless otherwise approved by the engineer. See specifications.

WN-19. All concrete for waterline work shall be a minimum of 3000 psi strength unless otherwise specified.

WN-20. Contractor shall protect water pipe ends from contaminated water and debris at all times. Contractor shall cap and/or cover pipe ends at the end of each work day.

WN-21. All existing services within paving limits shall be replaced by contractor. Contractor shall furnish and install meter boxes, install city supplied service meters and complete service connection. Contractor shall reconnect all existing services.

WN-22. Whenever water line crosses storm sewer lines, maintain a minimum 6 inches skin-to-skin clearance. Storm and water pipe joints shall be located a minimum of 5 feet away from all storm sewer crossings. Coordinate new storm sewer facilities locations with ODOT contractor to avoid conflicts with waterlines.

WN-23. Contact Clean Water Services for approval for discharging chlorinated water during flushing.

CONSTRUCTION SEQUENCE NOTES:

CN-1. Waterline construction requires close coordination with ODOT, see general requirements for waterline work.

CN-2. Disconnect existing 16" waterline from existing 24" waterline on McDonald Street and modify connection configuration as shown on the connection detail on sheet C-4B before waterline work begins.

CN-3. Installation of 36" steel pipe casing and 16" ductile iron waterline shall be completed from the SW McDonald side of Highway 99W with temporary blow-off installed on the SW Gaarde side of 99W as shown. Provide City and ODOT approved traffic control to redirect Gaarde Street right turn traffic as shown on sheet C-1 to provide work zone for testing and connecting pipe work.

CN-4. Install direct buried 16" waterline on McDonald Street between jack and bore launch pit and existing 16" waterline, complete connection as shown on sheet C-4B. Install direct buried 8" waterline between McDonald Street and 12" waterline connection on 99W as shown on C-5.

CN-5. Following completion of the installation of the pipelines within the casing and buried waterlines, the piping shall be pressure tested and disinfected as outlined below:

Perform hydrostatic pressure test on entire waterline using 150 psi test pressure with water supply from McDonald Street connection.

After hydrostatic pressure test, flush waterline as specified. Prior to chlorine disinfection, collect and test water samples for diesel and petroleum hydrocarbons and BTEX in accordance with DEQ methodology. If petroleum hydrocarbons are detected, contractor is responsible for additional flushing and testing at no additional cost to the owner.

When total hydrocarbon testing produces satisfactory results, conduct pipeline disinfection of entire waterline as specified. Contractor is responsible for demonstrating no petroleum hydrocarbon contamination inside the pipeline prior to backfilling the excavation.

SYMBOLS AND LEGEND:

	Existing	Proposed
Valve	⊙	⋈
Temporary Blow-off Assembly		↗
Thrust Block	△	▲
Long Sleeve		▭
Cap/plug		⊏
Reducer		⋗
Fitting		⊀
Water Meter	⌑	▣
Straddle Block		▨
Tapping Sleeve Assembly	—U W—	—U W—
Abandon Water Mains		≈≈≈
Utility Monitoring Point (UMP)		▽

*Note: All non-waterline symbols comply with ODOT standards.

CN-6. Contaminated soil and groundwater is anticipated on the SW McDonald side of Highway 99W. Contractor is responsible for proper disposal of impacted soil and groundwater and assuring a safe work environment. Prior to backfilling the launch pit on SW McDonald, the Contractor shall provide a seal between the casing and pipeline to prevent migration of groundwater and soil from the SW McDonald side of Highway 99W as well as the casing and surrounding ground to the SW Gaarde side of Highway 99W.

CN-7. Contractor shall remove the temporary blow-off assembly on the 16" waterline. Complete the connection to the existing 16" waterline on the SW Gaarde side of Highway 99W as shown including disconnecting the existing 16" from the existing 24" waterline and cutting and capping the portion of existing 16" waterline to be abandoned.

CN-8. Once the pipeline has been pressure tested and disinfected, the connection to the existing 16" waterline on the SW Gaarde side of Highway 99W shall be completed as shown including cutting portion of existing 16" waterline to be abandoned.

CN-9. Following completion of the connection on the SW Gaarde side of Highway 99W, the annular space between the 36" steel casing and cased 16" waterline and the interior of the abandoned section of 16" ductile iron pipe between the new connection and the existing 24" waterline shall be backfilled with grout as called out in Special Provision 00406.

REGISTERED PROFESSIONAL ENGINEER 85861 OREGON NOVEMBER 8, 2011 LUKE BENJAMIN ERICKSON
RENEWS 12-31-15

REGISTERED PROFESSIONAL ENGINEER 18542 OREGON JULY 10, 1996 JEFFREY S. JONES
RENEWS 6-30-15

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CITY OF TIGARD
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WATERLINE CROSSING
WASHINGTON COUNTY

Designed By - Jeff S. Jones & Jamie Schick
Drafted By - Rhonda L. Freeman

GENERAL WATERLINE NOTES AND LEGEND

G-2

EROSION CONTROL NOTES:

1. When rainfall and runoff occurs, daily inspections of the erosion and sediment controls and discharge outfalls must be provided by someone knowledgeable and experienced in the principles, practices, installation, and maintenance of erosion and sediment controls who works for the contractor.

2. Wet weather erosion control measures shall be in effect from October 1 through May 31 if exposed soils or soils not fully established.

3. During wet weather period, temporary stabilization of the site must occur at the end of each work day.

4. Sediment controls must be installed and maintained on all down gradient sides of the construction site at all times during construction. They must remain in place until permanent vegetation or other permanent covering of exposed soil is established.

5. All active inlets must have sediment controls installed and maintained at all times during construction unless otherwise approved. A surface mounted and attachable, u-shaped filter bag is required for all curb inlet catch basins.

6. Significant amounts of sediment which leaves the site must be cleaned up within 24 hours and placed back on the site and stabilized or properly disposed. The cause of the sediment release must be found and prevented from causing a recurrence of the discharge within the same 24 hours. Any instream clean up of sediment shall be performed according to the Oregon Department of State Lands required time frame.

7. Sediment must not be intentionally washed into storm sewers, drainage ways, or water bodies.

8. Sediment must be removed from behind all sediment control measures when it has reached a height of 1/3 the barrier height, and prior to the control measures removal.

9. Cleaning of all structures with sumps shall occur when the sediment retention capacity has been reduced by 50% and at the completion of project.

10. Any use of toxic or other hazardous materials must include proper storage, application, and disposal.

11. The contractor must properly manage hazardous wastes, used oils, contaminated soils, concrete waste, liquid waste, or other toxic substances discovered or generated during construction.

12. The application rate of fertilizers used to reestablish vegetation must follow manufacturer's recommendations. Nutrient releases from fertilizers to surface waters must be minimized. Time release fertilizers should be used and care should be made in application of fertilizers within any water way riparian zone.

13. Contractor or designated person shall be responsible for proper installation and maintenance of all erosion and sediment control measures, in accordance with current Clean Water Services standards and state and federal regulations.

14. Prior to any land disturbing activities, the boundaries of the clearing limits, vegetated buffers, and any sensitive areas shown on this plan shall be clearly delineated in the field. Unless otherwise approved, no disturbance is permitted beyond the clearing limits. The owner/permittee must maintain the delineation for the duration of the project. Note: vegetated corridors to be delineated with orange construction fence or approved equal.

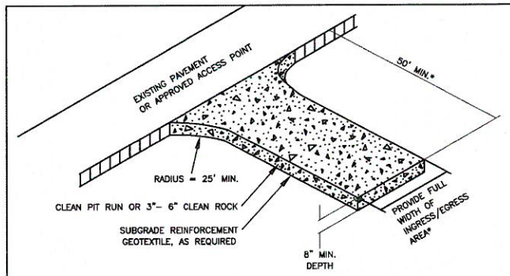
15. Prior to any land disturbing activities, the best management practices (BMP's) that must be installed are temporary sediment fence and inlet protection. These BMP's must be maintained for the duration of the project.

16. All pumping of sediment laden water must be discharged over an undisturbed, preferably vegetated area, and through a sediment control BMP (i.e. filter bag).

17. Written erosion and sediment control logs are suggested to be maintained on-site and available to County and City inspectors upon request.

18. In areas subject to wind erosion, appropriate BMP's must be used which may include the application of fine water spraying, plastic sheeting, mulching, or other approved measures.

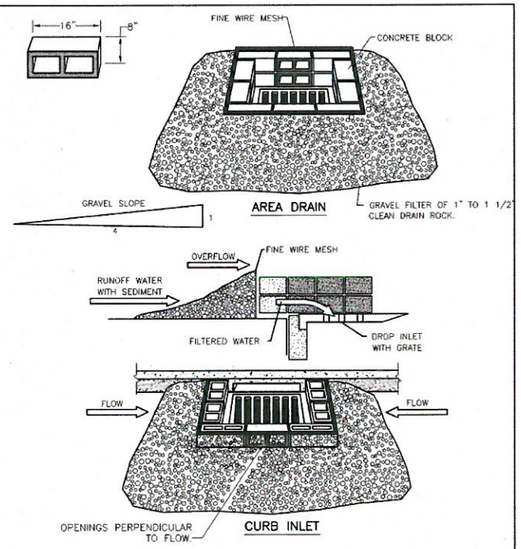
19. All exposed soils must be covered during wet weather period.



NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF- WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY
   20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE 3-6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

CONSTRUCTION ENTRANCE
Detail Drawing 855 REVISED 12-06

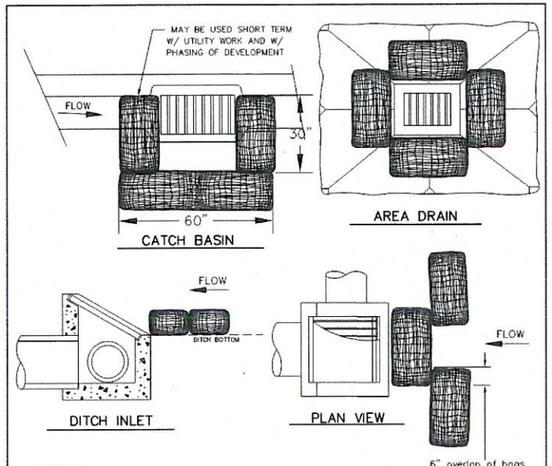


BLOCK AND GRAVEL INLET BARRIERS

NOTE:
BLOCKS SHALL BE STACKED WITH THE OPENINGS ON THE TOP AND BOTTOM EXCEPT FOR THE CENTER CONCRETE BLOCKS WHICH WILL HAVE OPENINGS PERPENDICULAR TO FLOW.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

INLET PROTECTION TYPE 2
DRAWING NO. 905 REVISED 12-06



NOTES:
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2"WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

INLET PROTECTION TYPE 4
DRAWING NO. 915 REVISED 12-06

Note:
All erosion control methods shall comply with applicable Clean Water Services detail drawings regardless if not shown on this sheet.

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CITY OF TIGARD
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WATERLINE CROSSING
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Designed By - Jeff S. Jones & Jamie Schick
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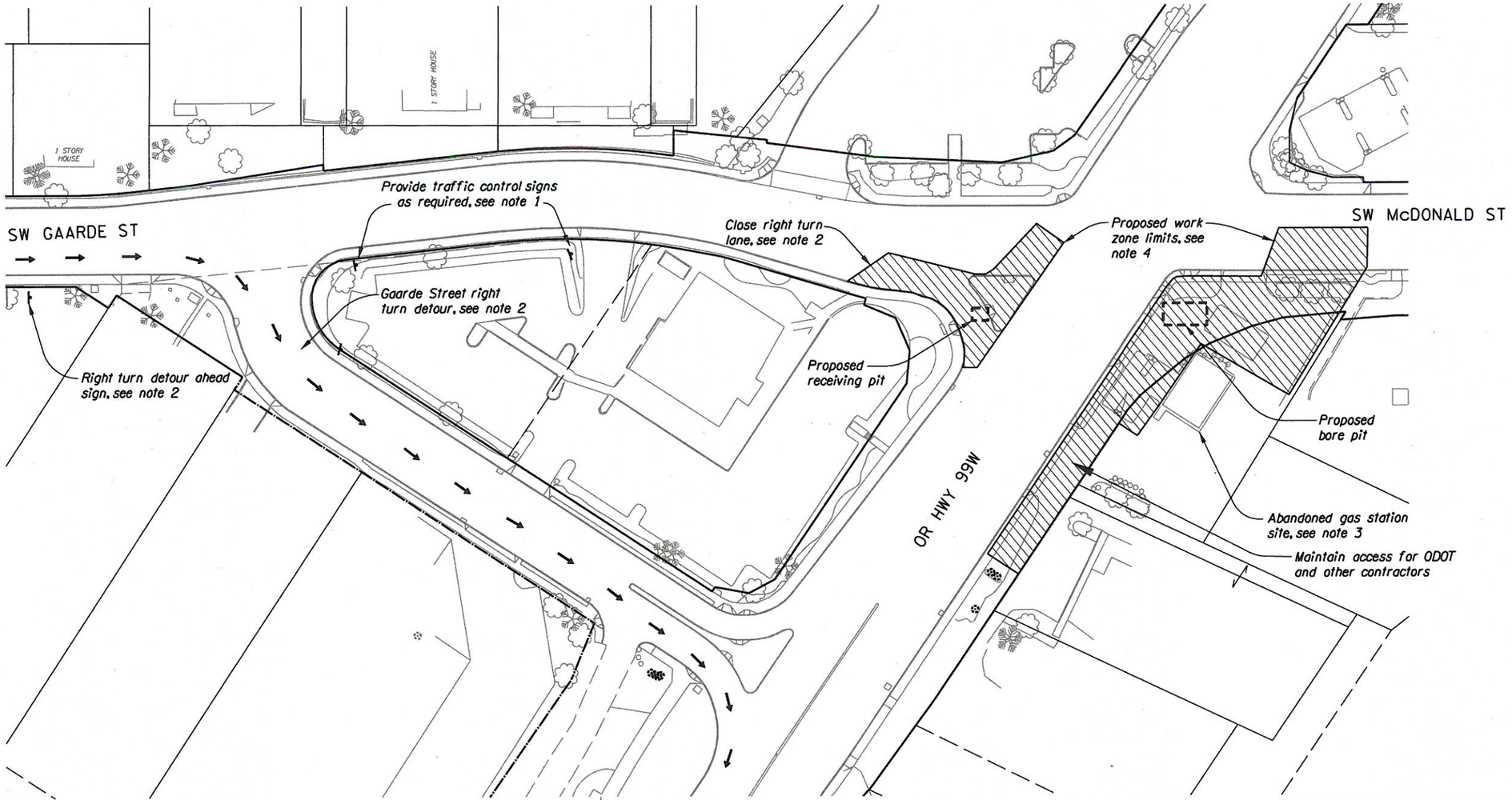
EROSION CONTROL NOTES AND DETAILS

SHEET NO. G-3



Notes:

1. Temporary traffic control shall comply with City and ODOT requirements and latest version of the Manual on Uniform Traffic Control Devices. Contractor shall obtain ODOT and City approval of complete traffic control plans prior to commencing any work in roadways.

2. Contractor shall submit to City and ODOT, traffic control plans that closes Gaarde St., right turn lane at 99W and McDonald St. intersection and redirects right turn traffic as generally shown. If work impacts through and/or left turn lane(s) of Gaarde St. or McDonals St. approaching or leaving Hwy 99W. Contractor should anticipate requirements for signal shut-off, several flaggers, and extensive traffic control.

3. Decommissioning of abandoned gas station facility to be completed by others. Contractor shall remove and dispose contaminated soil during bore pit, pipe trench, and bore excavations as specified in section 00294 of the special provision.

4. Excavation Surface Restoration Schedule shall be as follows:
   a. Within travel lanes of Gaarde and McDonald Streets: Replace pavement thickness shall equal existing pavement depth, 8" minimum or whichever is greater. 12" T-cuts required.

   b. Areas behind existing curbs and out of traffic: Temporary surface restoration shall consist of a minimum of 2" thick hot mix AC unless otherwise approved by ODOT or City.

   c. Gaarde Street right turn lane: Pavement thickness shall match existing. T-cut not required.

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TRAFFIC CONTROL AND PROJECT LIMITS PLAN

SHEET NO. C-1

SYMBOL **SURFACE RESTORATION REQUIREMENTS**

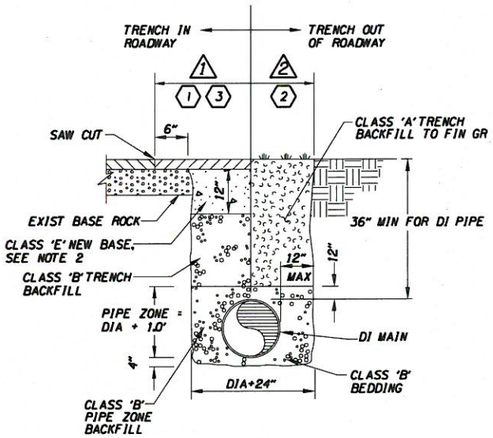
1. REPLACE REMOVED PAVEMENT IN ACCORDANCE WITH ODOT STANDARD SPECIFICATIONS.
2. REPLACE TOPSOIL & BACKFILL W/CLASS 'A' NATIVE MATL. FINISH TRENCH SURFACE TO MATCH ORIG CONTOURS. REPLACE EXIST LANDSCAPING.

BACKFILL REQUIREMENTS

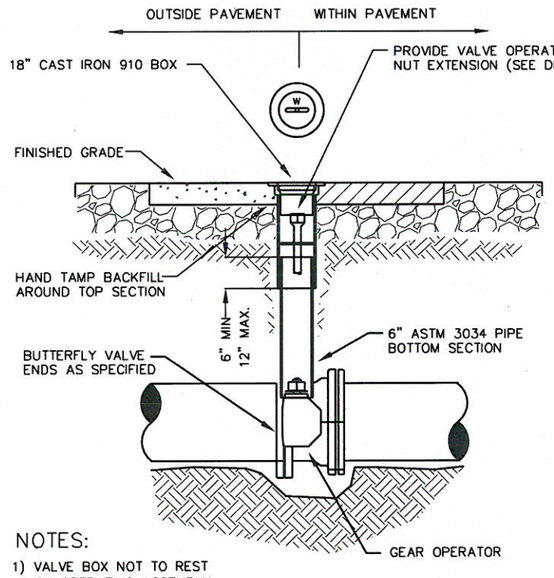
1. FURNISH & INSTALL: CLASS 'B' BEDDING & PIPE ZONE COMPACT MATL IN LIFTS TO ACHIEVE 95% OF MAX DENSITY IN ACCORDANCE W/AASHTO T-99.
2. FURNISH & INSTALL: CLASS 'B' BEDDING & PIPE ZONE BACKFILL COMPACTED TO 90% OF MAX DENSITY PER AASHTO T-99. FURNISH & INSTALL: CLASS 'A' NATIVE TRENCH BACKFILL TO FIN GR COMPACTED TO 90% MAX DENSITY PER AASHTO T-99.
3. FURNISH & INSTALL: CLASS 'E' BACKFILL FOR PAVEMENT BASE.

NOTES:

1. REFERENCE ODOT STANDARD SPECIFICATIONS, SECTION 00405 FOR PIPE ZONE MATERIAL AND BACKFILL.
2. CONTRACTOR SHALL DETERMINE APPROXIMATE GRADE OF NEW PROPOSED PAVEMENT IN DETERMINING CLASS 'E' BASE LOCATION.

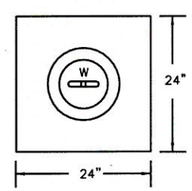


TYPICAL PIPE TRENCH DETAIL



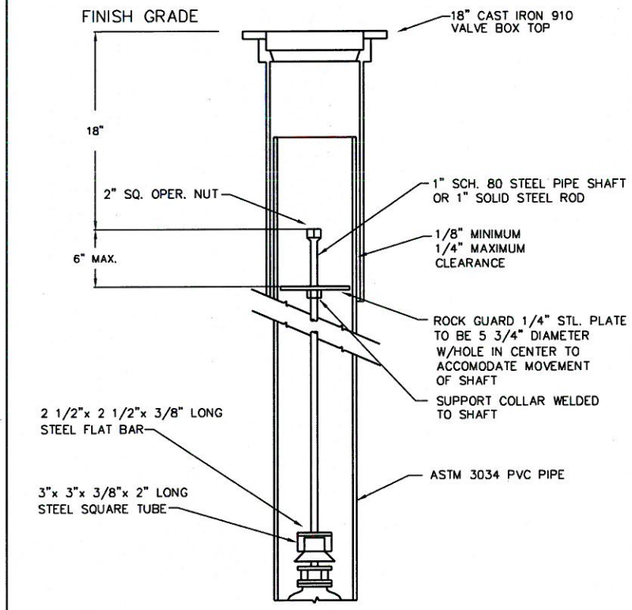
NOTES:

1) VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
2) OPERATING NUT EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE. SEE DETAIL W5.
3) CENTER VALVE BOX ON AXIS OF OPER. NUT.
4) PROVIDE 24" SQUARE BY 4" THICK CONCRETE PAD AROUND VALVE BOX OUTSIDE OF PAVED AREAS AS SHOWN IN CONCRETE PAD DETAIL



CONCRETE PAD

CITY OF TIGARD OREGON — ENGINEERING DEPARTMENT 13125 S.W. HALL BLVD. TIGARD, OREGON 97223 VOICE: (503) 639-4171 FAX: (503) 684-7297	APPROVED BY: AGUSTIN P. DUENAS, CITY ENGINEER; MARCH 1998, APPROVAL DATE	TYPICAL BUTTERFLY VALVE	NO SCALE; DWG. NO. 504



NOTE:

1) EXTEND 2" NUT TO WITHIN 18" OF FINISH GRADE WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE

CITY OF TIGARD OREGON — ENGINEERING DEPARTMENT 13125 S.W. HALL BLVD. TIGARD, OREGON 97223 VOICE: (503) 639-4171 FAX: (503) 684-7297	APPROVED BY: AGUSTIN P. DUENAS, CITY ENGINEER; MARCH 1998, APPROVAL DATE	OPERATING NUT EXTENSION	NO SCALE; DWG. NO. 505

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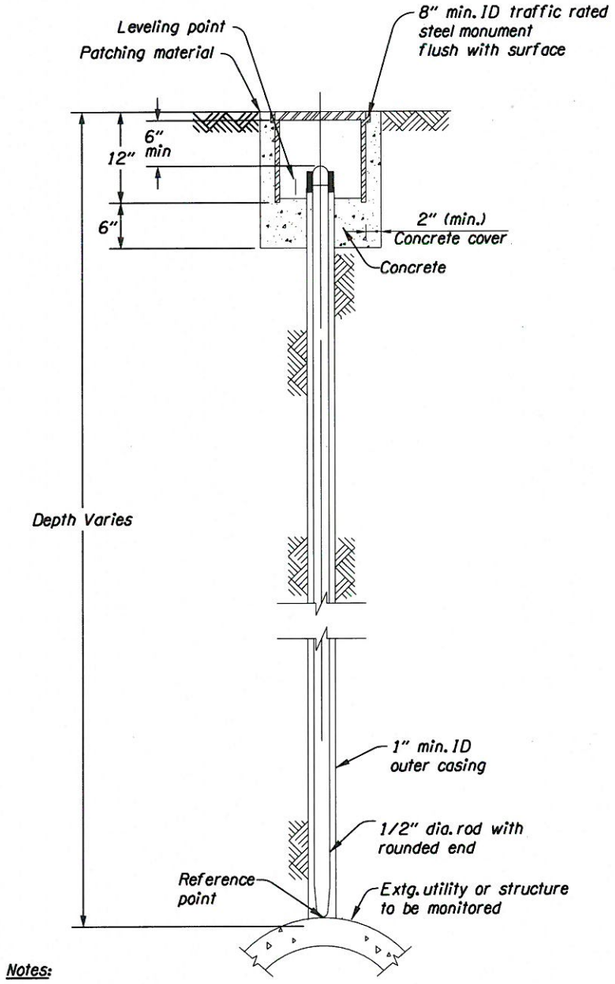
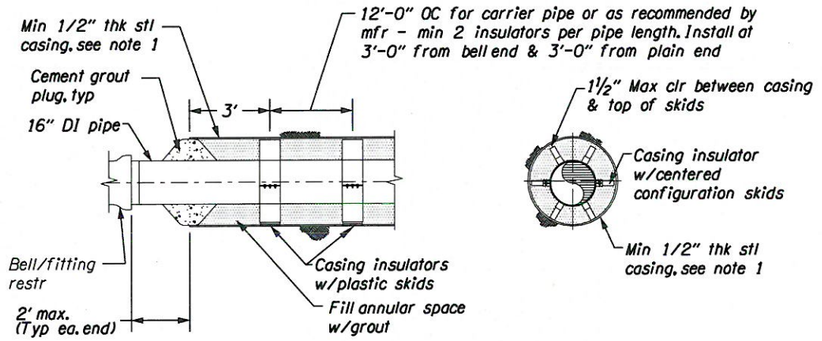
WATERLINE STANDARD DETAILS, COT — C-2



Notes:

1. Install instrumentation prior to starting casing installation. Take initial readings of all instruments prior to starting casing installation.
2. Take measurements at least once every 5 feet of casing advancement or at a minimum once per day if casing advancement is less than 5 feet in any given day. Measurements shall be taken once casing installation begins until the full casing has been installed.
3. Maximum allowable settlement is 1 inch. Provide written notice within 24 hours of occurrence when 50% of maximum allowable settlement is reached. Meet with engineer within 24 hours of providing notice to discuss contractor means and methods to determine what changes, if any, must be made to better control ground movement. If maximum allowable settlement is reached, stop all work immediately and provide immediate written notice. Meet with the engineer to develop a plan of action before the work is resumed.

▽ UTILITY MONITORING POINT (UMP)

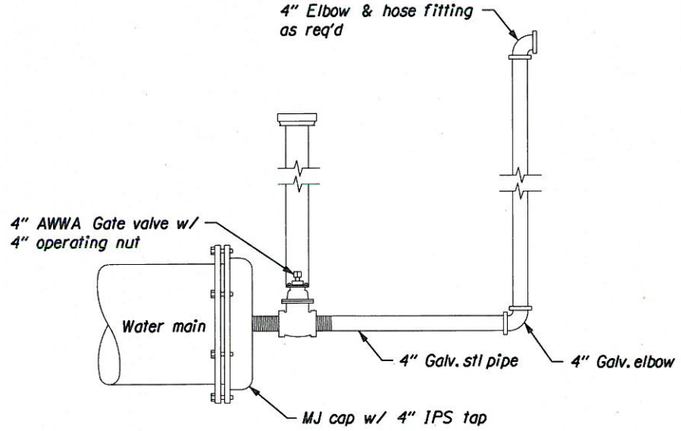


END DETAIL SECTION A-A

Notes:

1. Casing thickness has been sized for anticipated earth pressures. Contractor is responsible for sizing casing for installation loads. Required casing material and wall thickness dependent upon installation method, depth of bury, soil conditions, and other factors. Casing diameter may need to be increased to accommodate greater wall thickness of carrier pipe or casing.
2. Provide 2" minimum clearance between casing and carrier pipe bells and appurtenances.
3. Annulus between steel casing and waterline shall be completely backfilled with cement grout.

CASING DETAIL



Notes:

1. Provide temporary thrust restraint as required.
2. See specifications regarding disposal/dechlorination for superchlorinated water.

TEMPORARY BLOW-OFF ASSEMBLY

REGISTERED PROFESSIONAL ENGINEER 85861 OREGON NOVEMBER 8, 2011 LUKE BENJAMIN ERICKSON
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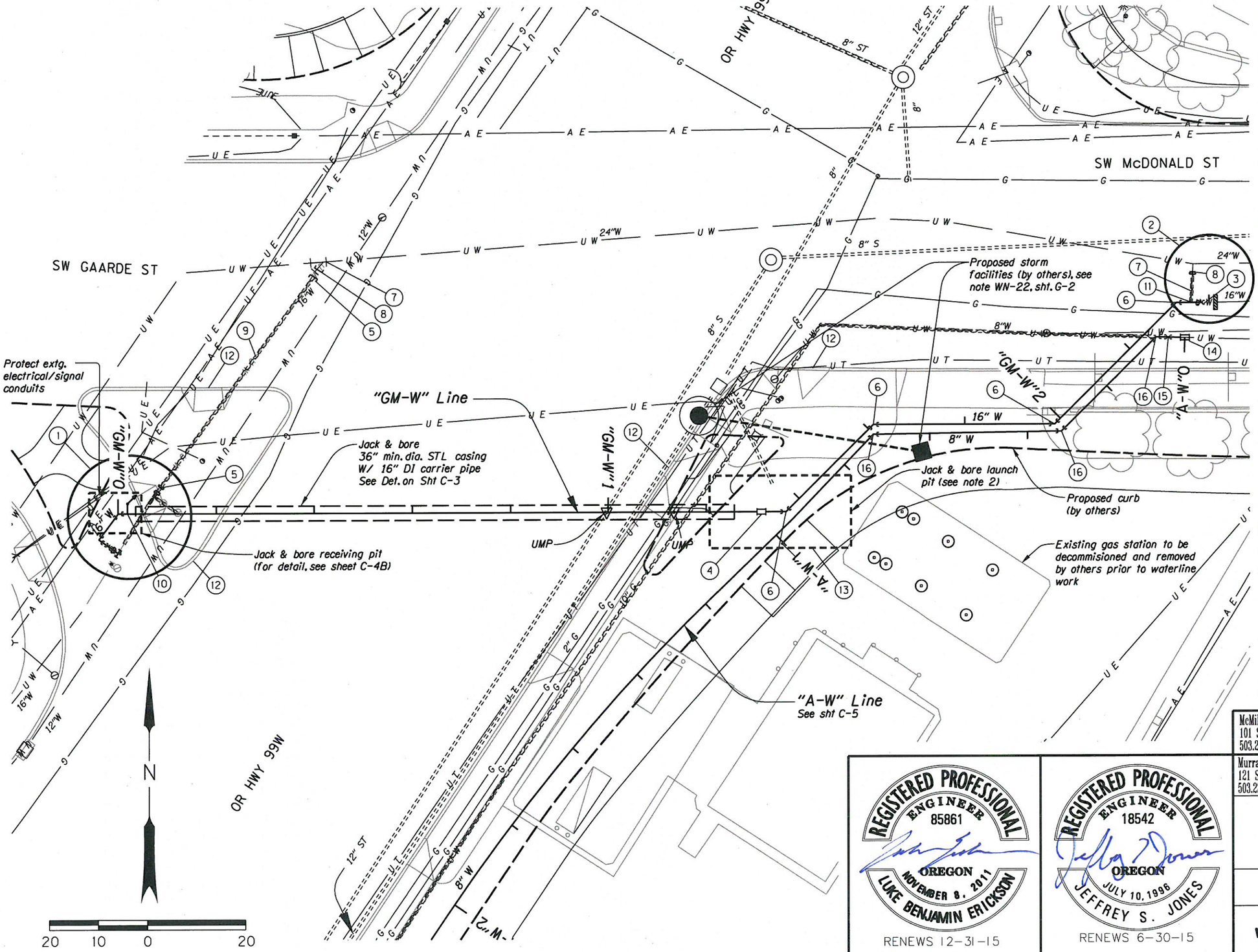
CASING CROSSING DETAILS C-3



1. See Gaarde St. connection detail, sheet C-4B
2. See McDonald St. connection detail, sheet C-4B
3. 16" BFV, MJ
4. 16" LS, as req'd
5. 16" Cap, MJ
6. 16" 45°Bend, MJ
7. Disconnect extg. 16" from extg. 24", see connection details, sheet C-4B
8. 16" plug, MJ
9. Abandon extg. 16" waterline in place and fill w/ grout
10. Temp blow-off, see detail, sheet C-3
11. Connect to modified McDonald connection, see McDonald connection detail sheet C4B
12. Provide pedestrian access to sidewalks during construction
13. Provide secondary containment around launch pit and trench excavation to prevent surface runoff from entering.
14. 8" LS
15. 8" GV, MJ
16. 8" 45° Bend, MJ
17. 12" LS
18. 8"x12" RDCR, MJ

Notes:

1. All pipe to be restrained.
2. Contractor to determine configuration and size of pit based on selected means and methods for pit and casing installation. Select shoring and shoring installation methods that protect existing utilities from damage or disturbance.
3. Soil and groundwater within the launch pit and portions of the bored pipeline and pipe trench are impacted with low levels of petroleum hydrocarbons. See specification 00294 for handling and disposal.
4. Unattended pits shall either be protected by a six-foot fence, backfilled, or steel plated and pinned.

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503.225.9010

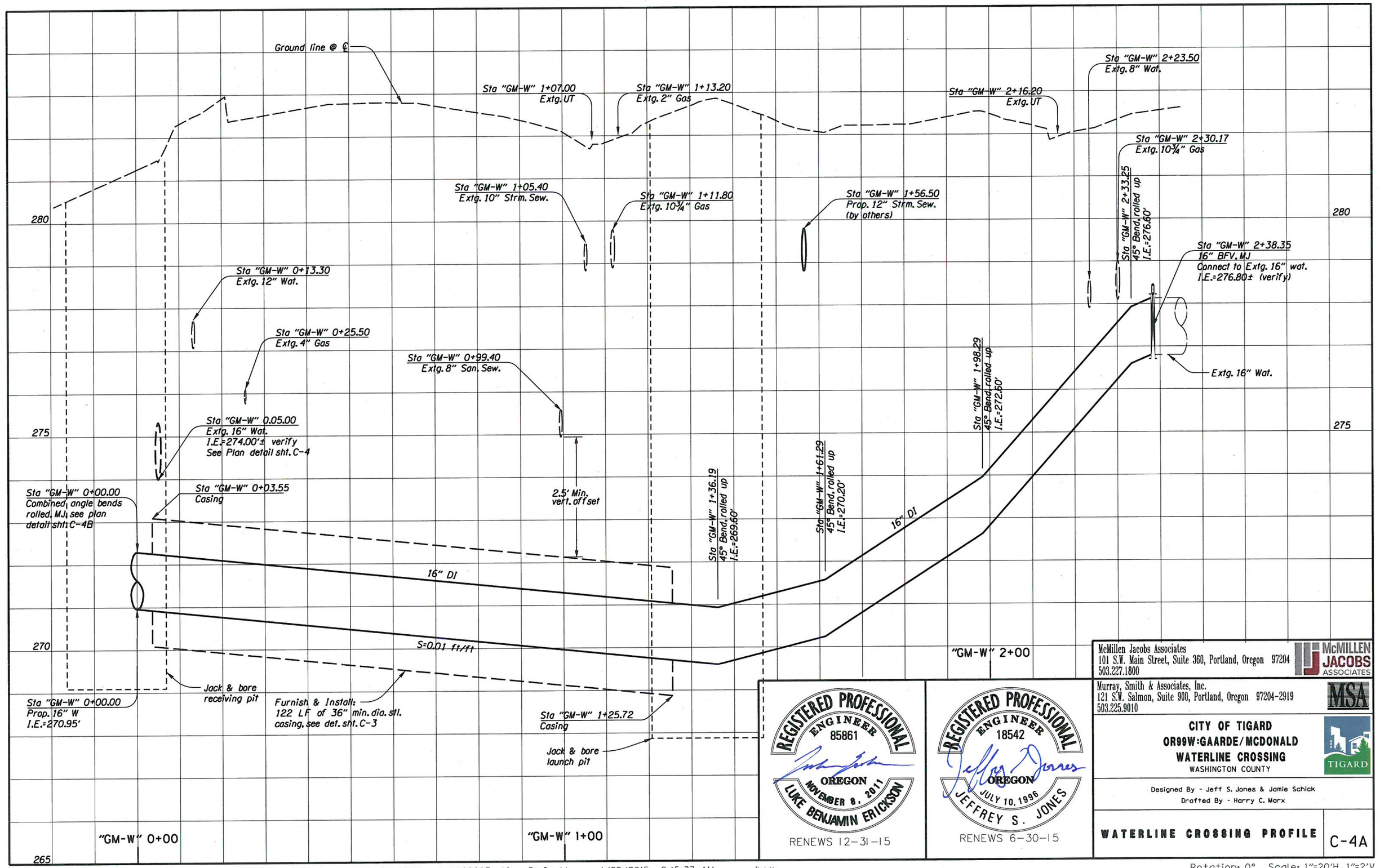
REGISTERED PROFESSIONAL ENGINEER
85861
OREGON
NOVEMBER 8, 2011
LUKE BENJAMIN ERICKSON
RENEWS 12-31-15

REGISTERED PROFESSIONAL ENGINEER
18542
OREGON
JULY 10, 1996
JEFFREY S. JONES
RENEWS 6-30-15

CITY OF TIGARD
OR99W:GAARDE/MCDONALD
WATERLINE CROSSING
WASHINGTON COUNTY

Designed By - Jeff S. Jones & Jamie Schick
Drafted By - Rhonda L. Freeman

WATERLINE CROSSING PLAN C-4



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CITY OF TIGARD
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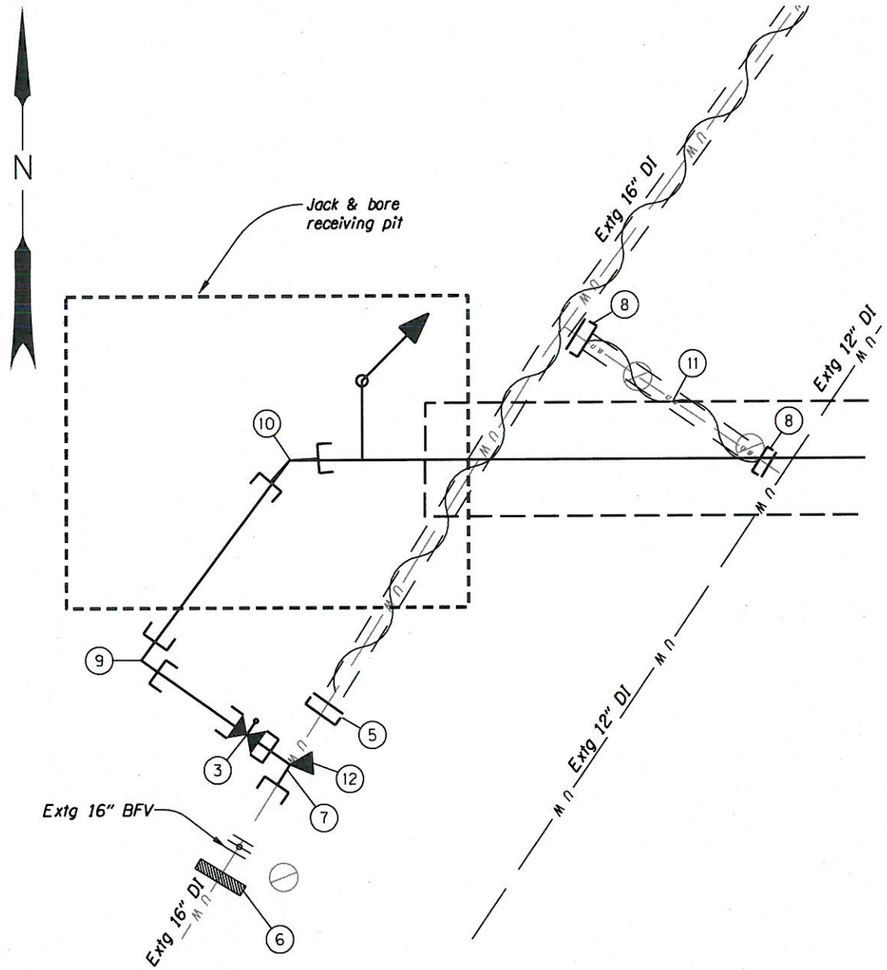
WATERLINE CROSSING
WASHINGTON COUNTY

Designed By - Jeff S. Jones & Jamie Schick
Drafted By - Harry C. Marx

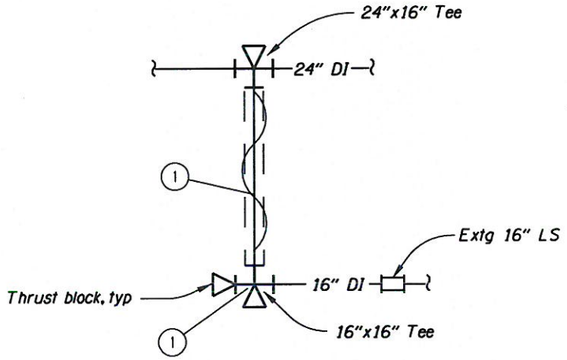
WATERLINE CROSSING PROFILE C-4A



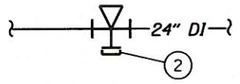
Gaarde Connection Details

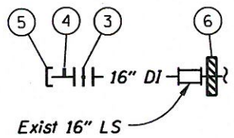
Scale: 1"=5'

1. Remove extg. 16" tee, concrete thrust blocks and 16" connecting piping
2. 16" Plug, MJ
3. 16" BFV, MJ
4. 1" Corp stop top of pipe 18" west of 16"
5. 16" Cap, MJ, fill and abandon 16" DI piping, see note CN-9, sheet G-2
6. Straddle block tie to 16" BFV, see detail this sheet
7. 16" 90° bend, MJ
8. Plug 12" outlets on extg tees w/ plug or blind flanges, contractor to confirm
9. 16" 90° bend, rolled down, MJ
10. 16" Combined angle bends, rolled up, MJ (45°, 22.5° & 11.25°)
11. Remove extg 12" connecting piping and 12" valves
12. Thrust block



Existing Connection Configuration

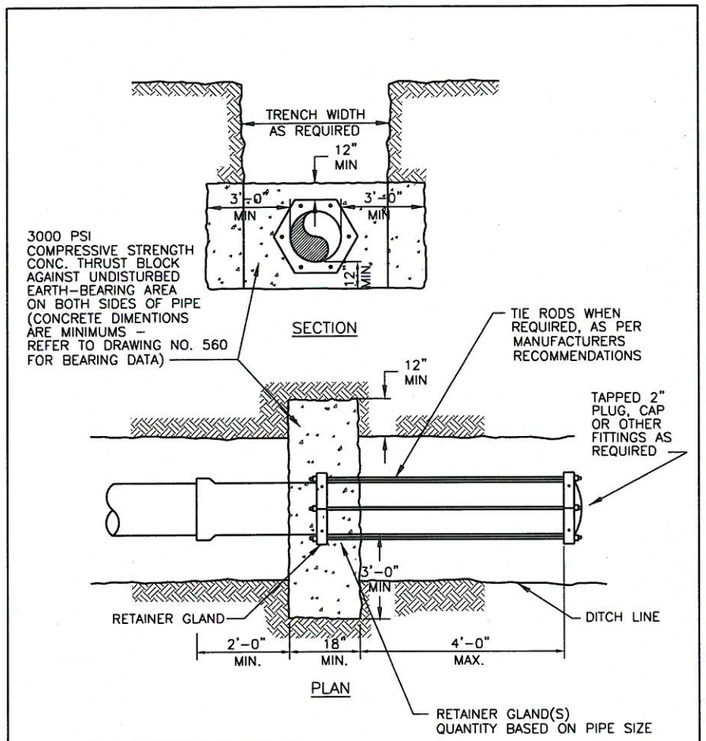




Modified Connection Configuration

McDonald Connection Details

Scale: NTS



STRADDLE BLOCKS TO BE USED AT:

1. END OF LINE BLOW OFFS
2. BLIND TEES
3. BLIND CROSSES
4. VERTICAL BENDS

CITY OF TIGARD OREGON — ENGINEERING DEPARTMENT, 13125 S.W. HALL BLVD., TIGARD, OREGON 97223, VOICE: (503) 639-4171, FAX: (503) 684-7297	APPROVED BY: AGUSTIN P. DUENAS, CITY ENGINEER; MARCH 1998, APPROVAL DATE	STRADDLE BLOCK	NO SCALE; DWG. NO. 561

Notes:

1. All pipe to be restrained.

REGISTERED PROFESSIONAL ENGINEER 18542 OREGON JULY 10, 1996 JEFFREY S. JONES
RENEWS 6-30-15

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CITY OF TIGARD
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WATERLINE CROSSING
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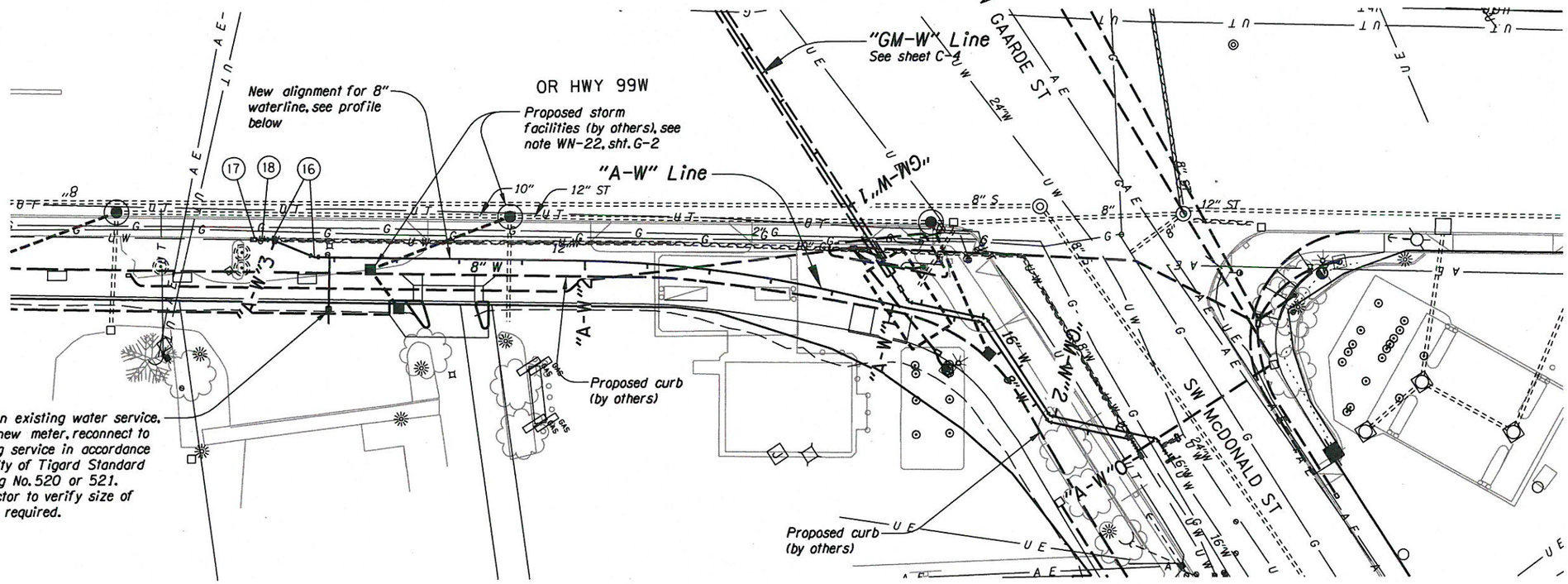
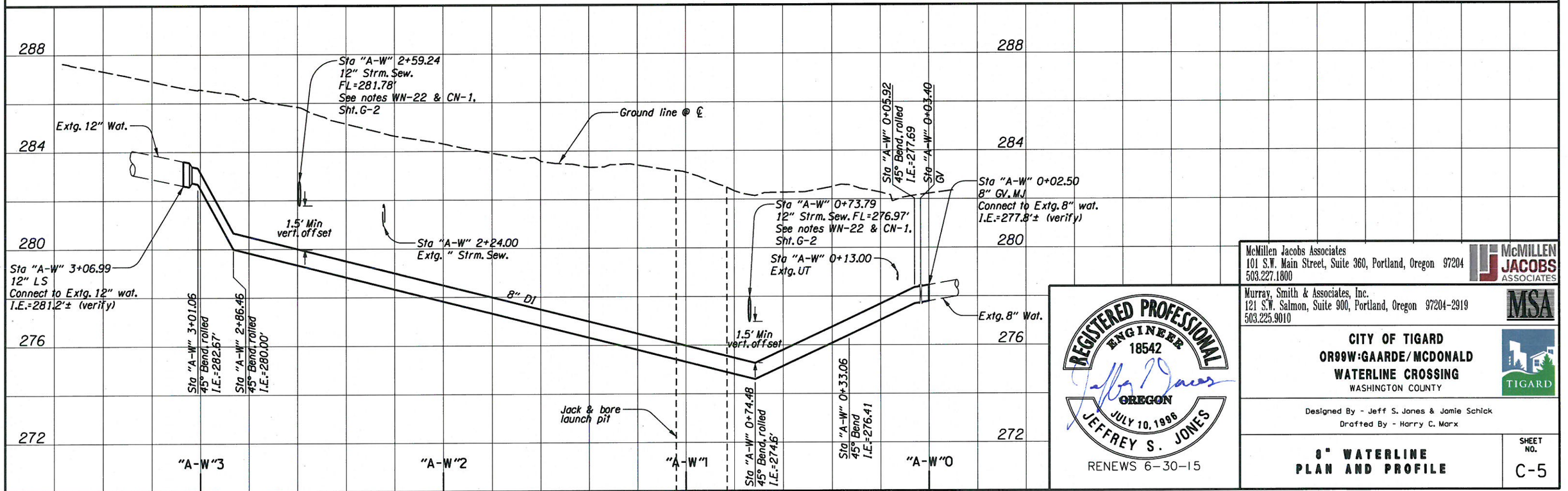
16" WATERLINE CONNECTION DETAILS — C-4B



NOTE:

1. All waterline trench backfill shall comply with trench in roadway requirements on trench detail, sheet C-2.

2. All pipe joints shall be restrained.



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8" WATERLINE
PLAN AND PROFILE

SHEET NO. C-5