

STORMWATER STANDARD DRAWING INDEX

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STORMWATER STANDARD DRAWING

STORMWATER STANDARD DRAWING INDEX

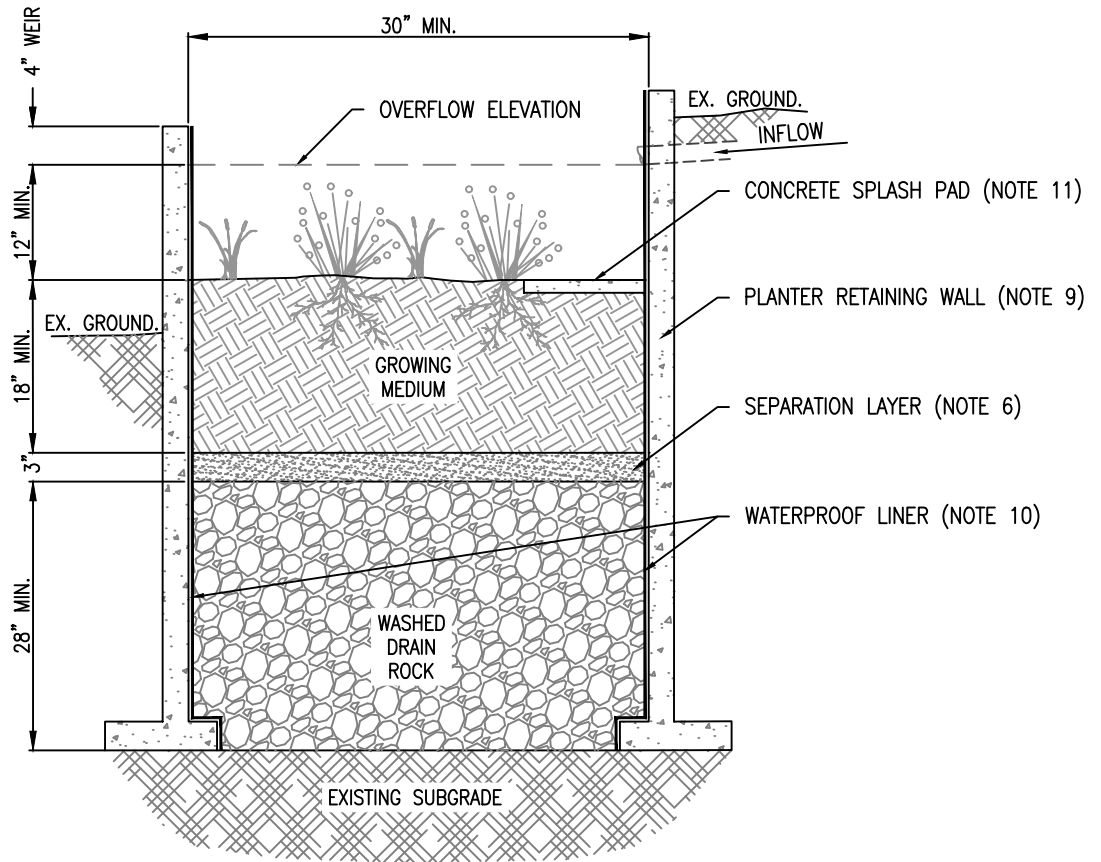
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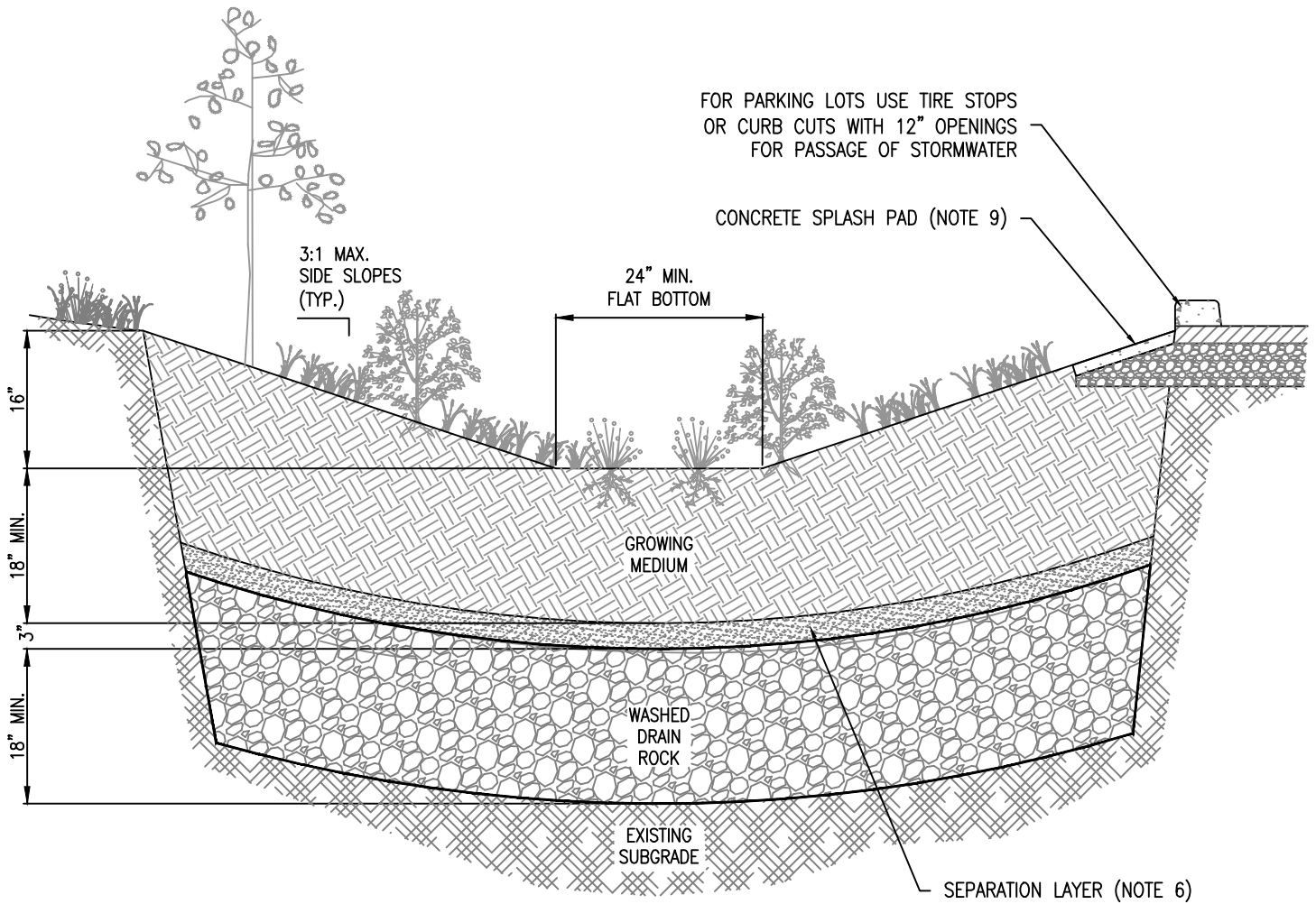
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NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
 - WIDTH: 30" MINIMUM
 - DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW WEIR ELEVATION): 12"
 - SLOPE OF PLANTER: 0.5% OR LESS
3. PLANTER MUST BE SETBACK A MINIMUM OF 5 FEET FROM PROPERTY LINE.
4. OVERFLOW WEIR ELEVATION MUST ALLOW FOR 4" OF FREEBOARD, MINIMUM. SIZE OVERFLOW WEIR FOR THE 100 YEAR DESIGN STORM. IDENTIFY EMERGENCY OVERFLOW ROUTE ON THE STORMWATER MANAGEMENT PLAN.
5. DRAIN ROCK SIZE: 1 1/2" - 3/4" WASHED WITH MINIMUM 28" DEPTH.
6. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. GROWING MEDIUM WILL BE A MINIMUM 18" DEPTH. FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. VEGETATION WILL FOLLOW THE LANDSCAPE PLANS.
9. PLANTER WALL MATERIAL SHALL BE STONE, BRICK, CONCRETE OR OTHER DURABLE MATERIAL AND SHALL BE INCLUDED ON FOUNDATION PLANS. INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTERS AND ROAD SUBGRADE. WALL HEIGHTS GREATER THAN 24" ABOVE GRADE REQUIRE HANDRAILS. SUBMIT RETAINING WALL DESIGN IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.
10. WATERPROOF LINER SHALL BE 30 MIL PVC OR EQUIVALENT. A WATERPROOF LINER IS NOT REQUIRED IF THE WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
11. INSTALL CONCRETE SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF PAD SHALL BE 1 FT X 1 FT.
12. SEASONAL HIGH GROUNDWATER SEPARATION DISTANCE AS REQUIRED.

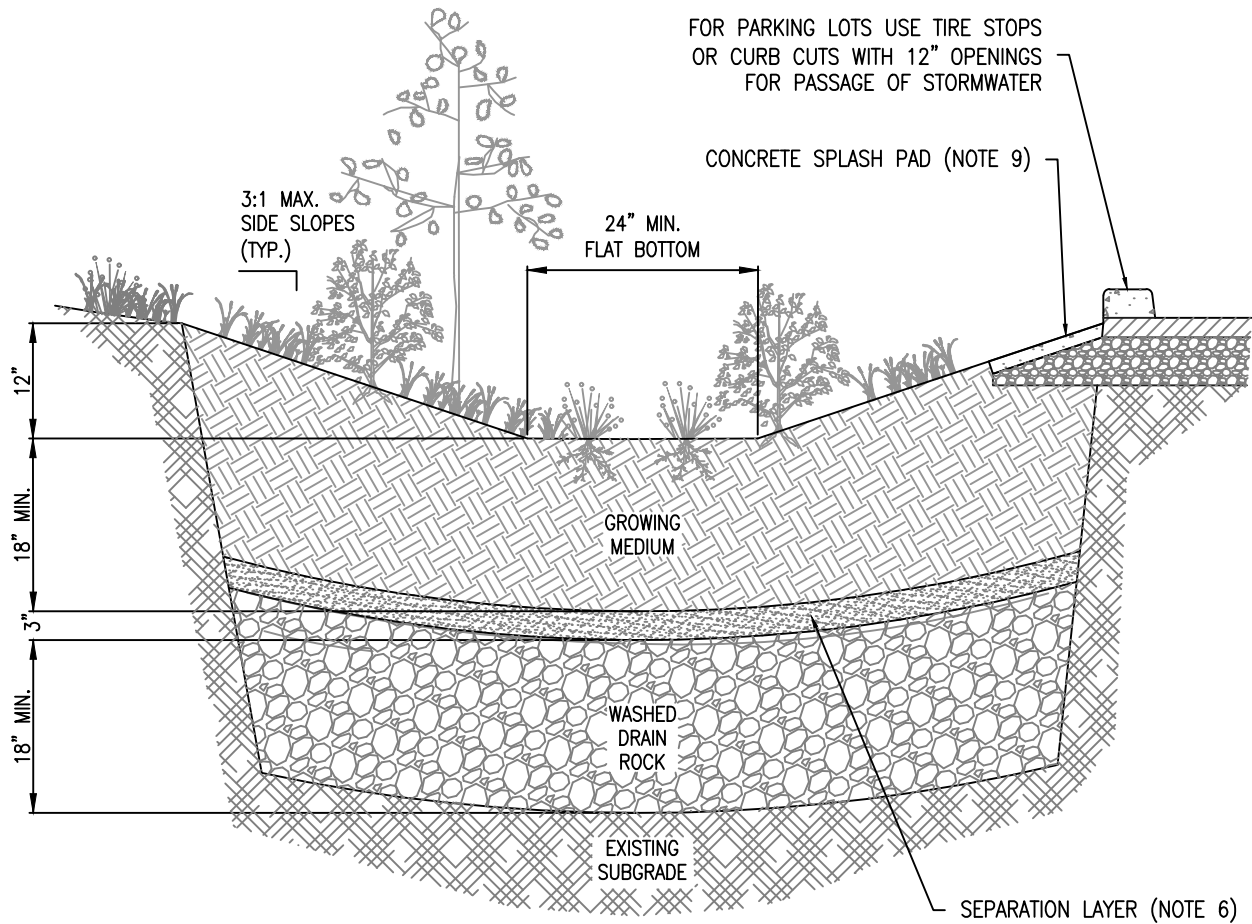
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NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
 - DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 16"
 - FLAT BOTTOM WIDTH: 24" MINIMUM
 - SIDE SLOPES OF BASIN: 3:1 MAXIMUM
 - SLOPE OF RAINGARDEN: 0.5% OR LESS
3. INFILTRATION RAINGARDEN MUST BE SETBACK A MINIMUM OF 10 FEET FROM FOUNDATIONS AND 5 FEET FROM PROPERTY LINE.
4. IDENTIFY EMERGENCY OVERFLOW ROUTE FOR THE 100 YEAR DESIGN STORM ON THE STORMWATER MANAGEMENT PLAN.
5. DRAIN ROCK SIZE: 1 1/2" - 3/4" WASHED WITH 18" DEPTH.
6. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. GROWING MEDIUM WILL BE A MINIMUM 18" DEPTH. FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. VEGETATION WILL FOLLOW THE LANDSCAPE PLANS.
9. INSTALL CONCRETE SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM.
10. SEASONAL HIGH GROUNDWATER SEPARATION DISTANCE AS REQUIRED.

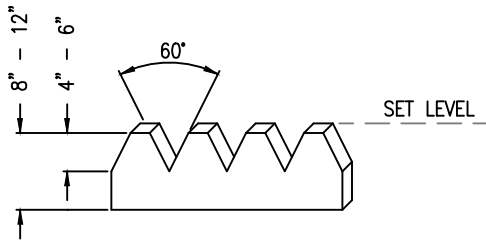
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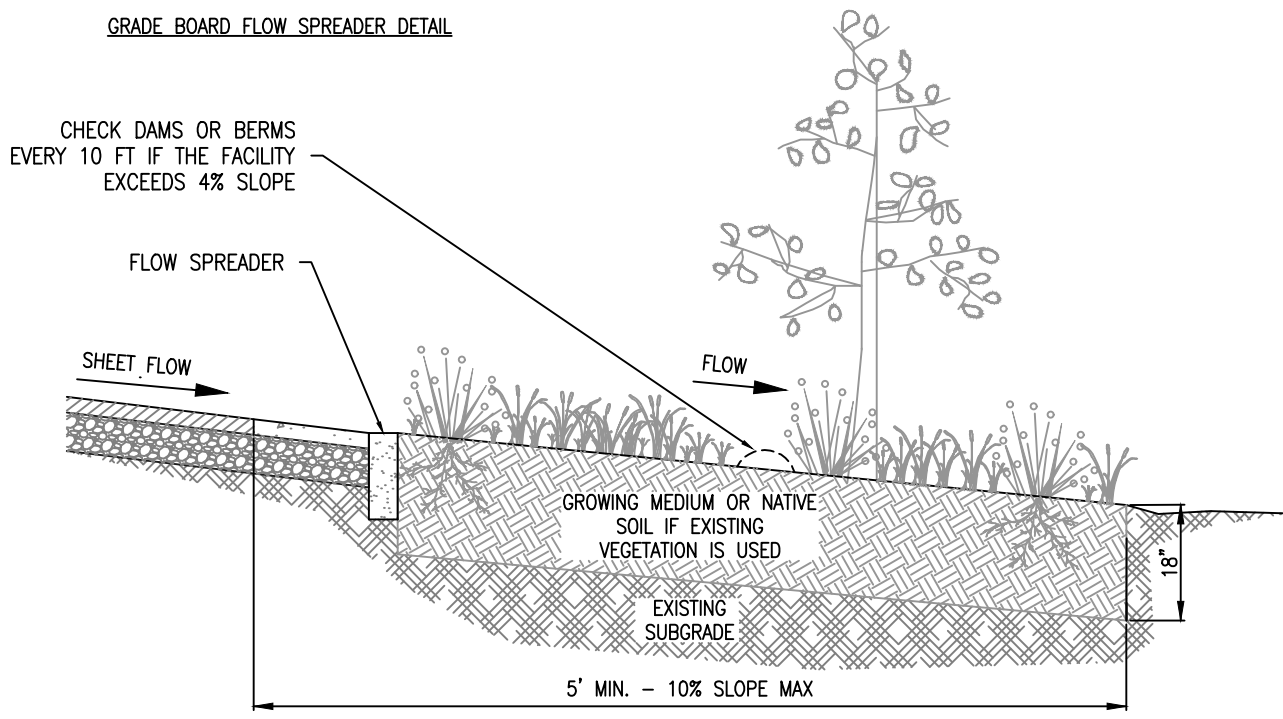
NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
 - DEPTH OF SWALE (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
 - FLAT BOTTOM WIDTH: 24" MINIMUM
 - SIDE SLOPES OF SWALE: 3:1 MAXIMUM
 - LONGITUDINAL SLOPE OF SWALE: 6% OR LESS
3. INFILTRATION VEGETATED SWALES MUST BE SETBACK A MINIMUM OF 10 FEET FROM FOUNDATIONS AND 5 FEET FROM PROPERTY LINE.
4. IDENTIFY EMERGENCY OVERFLOW ROUTE FOR THE 100 YEAR DESIGN STORM ON THE STORMWATER MANAGEMENT PLAN.
5. DRAIN ROCK SIZE: 1 1/2" - 3/4" WASHED WITH 18" DEPTH.
6. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. GROWING MEDIUM WILL BE A MINIMUM 18" DEPTH. FACILITY SURFACE AREA MAY BE REDUCED BY 20% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. VEGETATION WILL FOLLOW THE LANDSCAPE PLANS.
9. INSTALL CONCRETE SPLASH PAD TO TRANSITION FROM INLET TO GROWING MEDIUM.
10. CHECK DAMS ARE REQUIRED FOR LONGITUDINAL SLOPES OVER 4% AND SHALL BE SPACED AT A MAXIMUM OF 2-FOOT ELEVATION INTERVALS. MAINTAIN 4-10 INCH DEEP ROCK CHECK DAMS AT DESIGN INTERVALS.
11. SEASONAL HIGH GROUNDWATER SEPARATION DISTANCE AS REQUIRED.

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GRADE BOARD FLOW SPREADER DETAIL



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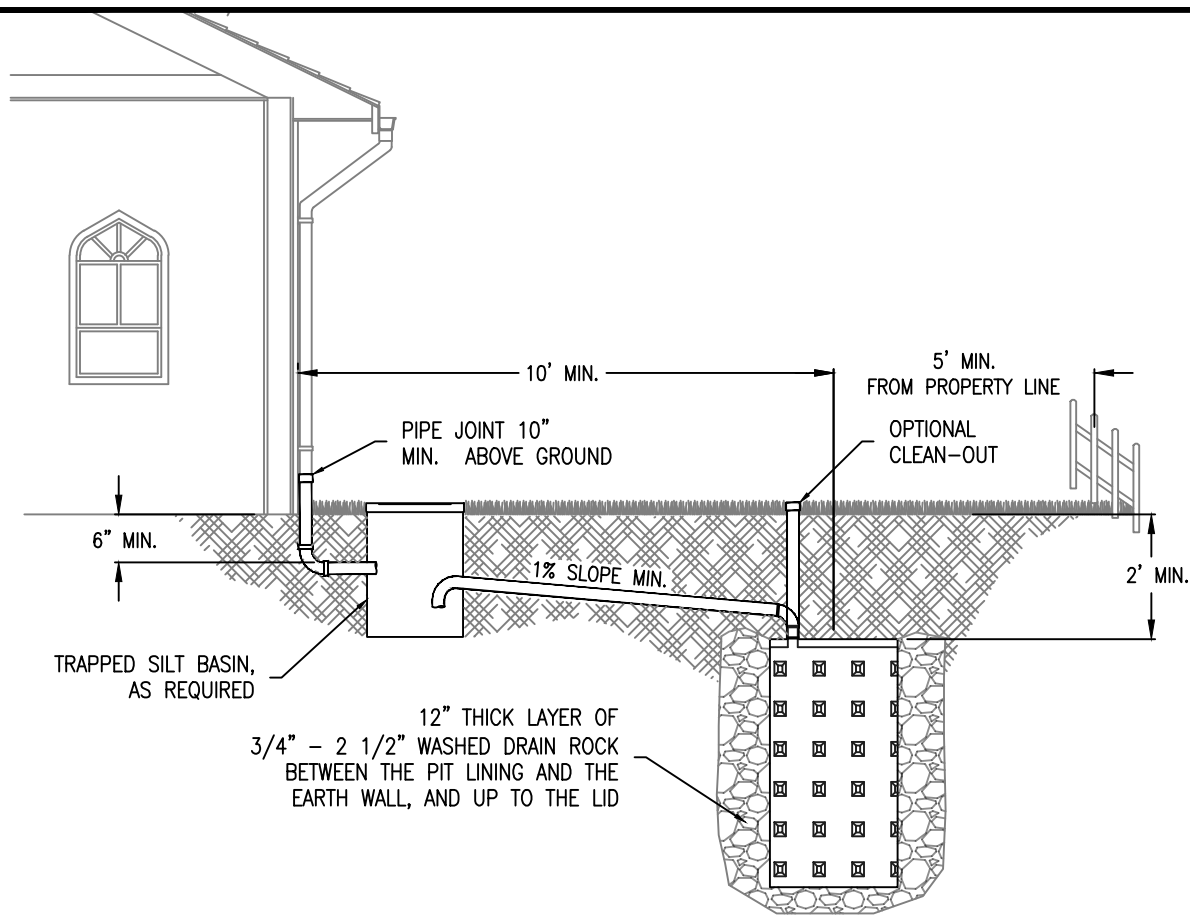
1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
 - LENGTH: 5' MINIMUM
 - LONGITUDINAL SLOPE OF PLANTER: 0.5% TO 10%
3. FILTER STRIP MUST BE SETBACK A MINIMUM OF 5 FEET FROM PROPERTY LINE, 10 FEET FROM BUILDINGS, 50 FEET FROM WETLANDS, RIVERS, STREAMS AND CREEKS.
4. COLLECTION AND CONVEYANCE TO APPROVED DISCHARGE POINT MAY BE REQUIRED DEPENDING ON DESIGN AND SHALL BE SPECIFIED ON PLANS ACCORDING TO OLWS STANDARDS.
5. UNLESS EXISTING VEGETATED AREAS ARE USED FOR THE FILTER STRIP, GROWING MEDIUM SHALL BE USED WITHIN THE TOP 18". USE SAND/LOAM/COMPOST 3-WAY MIX OR APPROVED MIX THAT WILL SUPPORT HEALTHY PLANTS.
6. THE ENTIRE FILTER STRIP MUST HAVE 100% COVERAGE BY NATIVE GRASSES, NATIVE WILDFLOWER BLENDS, NATIVE GROUND COVERS, OR ANY COMBINATION THEREOF.
7. A GRADE BOARD OR SAND/GRAVEL TRENCH MAY BE REQUIRED AS A FLOW SPREADER TO DISPERSE THE RUNOFF EVENLY ACROSS THE FILTER STRIP TO PREVENT A POINT OF DISCHARGE. THE TOP OF THE LEVEL SPREADER MUST BE HORIZONTAL AND AT AN APPROPRIATE HEIGHT TO PROVIDE SHEETFLOW DIRECTLY TO THE SOIL WITHOUT SCOUR. LEVEL SPREADERS SHALL NOT HOLD A PERMANENT VOLUME OF RUNOFF. GRADE BOARDS CAN BE MADE OF ANY MATERIAL THAT WILL WITHSTAND WEATHER AND SOLAR DEGRADATION, TRENCHES USED AS LEVEL SPREADERS CAN BE FILLED WITH WASHED CRUSHED ROCK, PEA GRAVEL, OR SAND.
8. CHECK DAMS ARE REQUIRED FOR LONGITUDINAL SLOPES OVER 4% AND SHALL BE SPACED AT A MAXIMUM OF 2-FOOT ELEVATION INTERVALS. MAINTAIN 4-10 INCH DEEP ROCK CHECK DAMS AT DESIGN INTERVALS.

OAK LODGE
 WATER SERVICES
 STORMWATER STANDARD DRAWING

FILTER STRIP			
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DRAWING NO.
207

DATE: 4/10/2024
 SCALE: NTS



1. SIZING: SEE ADJACENT TABLE TO SIZE THE DRYWELL(S) BASED ON IMPERVIOUS AREA.
2. SITING CRITERIA: THE BASE OF THE DRYWELL MUST BE AT LEAST 5' ABOVE SEASONAL HIGH GROUNDWATER.
3. SETBACKS: MEASURED FROM THE CENTER, THE DRYWELL MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES EXCEPT NEXT TO THE RIGHT-OF-WAY WHERE NO SETBACK IS REQUIRED BETWEEN THE EDGE OF THE DRYWELL DRAIN ROCK AND THE PROPERTY LINE. THE FOUNDATION SETBACK IS 8" FOR PLASTIC MINI-DRYWELLS.
4. PIPING: CONFORM WITH OREGON PLUMBING SPECIALTY CODE (OPSC) REQUIREMENTS.
5. ACCESS: IN RESIDENTIAL SETTINGS, AN ACCESS CLEANOUT IS OPTIONAL BUT HIGHLY RECOMMENDED.
6. PRE-TREATMENT: A TRAPPED SILT BASIN SUCH AS A SUMPED CATCH BASIN IS REQUIRED EXCEPT FOR DRYWELLS MANAGING ROOF RUNOFF AND RUNOFF FROM PEDESTRIAN-ONLY AREAS.
7. THE TOP OF THE PERFORATED DRYWELL SECTIONS MUST BE LOWER THAN NEIGHBORING FOUNDATIONS.

Drywell Depth	Maximum Catchment Area Managed by One Drywell	
	28" diameter	48" diameter
5'	1000 sf	2500 sf
10'	2500 sf	4500 sf
15'	3500 sf	5000 sf
2x2 plastic mini-drywell (maximum of 2 drywells per catchment)	500 sf	

CONSTRUCTION REQUIREMENTS

SMEARING THE SOIL SURFACE DURING EXCAVATION CAN LIMIT INFILTRATION RATES. IF SMOOTH EXCAVATION TOOLS ARE USED, ROUGHEN THE SIDES AND BOTTOM OF THE EXCAVATION WITH A SHARP POINTED TOOL. REMOVE LOOSE MATERIAL FROM THE BOTTOM OF THE EXCAVATION.



STORMWATER STANDARD DRAWING

DRYWELL

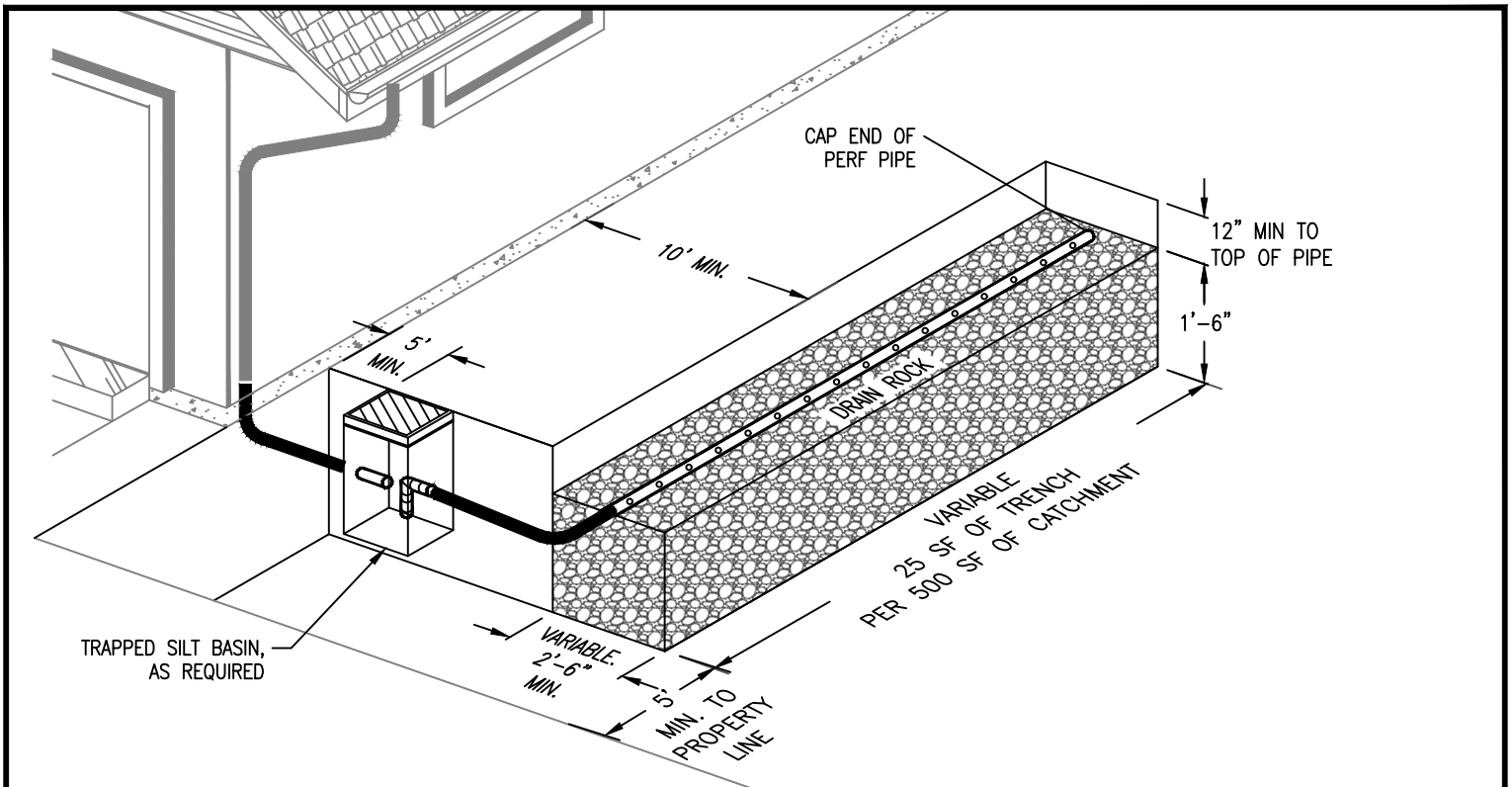
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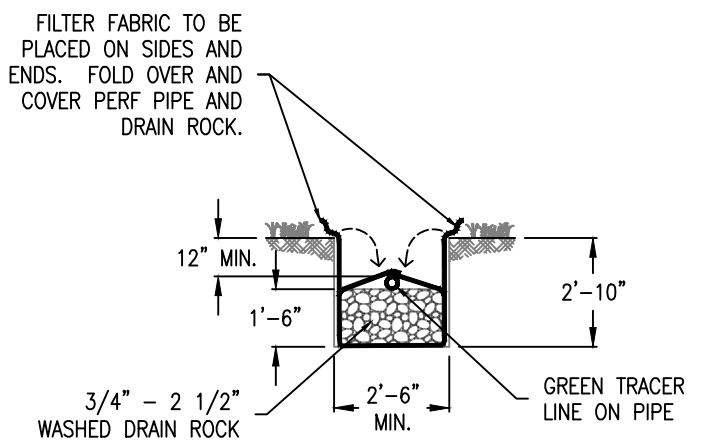
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1. SITING CRITERIA: THE BASE OF THE SOAKAGE TRENCH MUST BE AT LEAST 5' ABOVE SEASONAL HIGH GROUNDWATER.
2. SIZING: 1'-6" TALL, 2'-6" WIDE MINIMUM. 25 SQUARE FEET OF TRENCH PER 500 SQUARE FEET OF CATCHMENT AREA.
3. SETBACKS: MEASURED FROM THE EDGE, THE SOAKAGE TRENCH MUST BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES, EXCEPT NEXT TO THE RIGHT-OF-WAY.
4. PRE-TREATMENT: A TRAPPED SILT BASIN SUCH AS A SUMPED CATCH BASIN IS REQUIRED EXCEPT FOR SOAKAGE TRENCHES MANAGING ROOF RUNOFF AND RUNOFF FROM PEDESTRIAN-ONLY AREAS.
5. PIPING: CONFORM WITH OREGON PLUMBING SPECIALTY CODE (OPSC) REQUIREMENTS.
6. THE TOP OF THE SOAKAGE TRENCH MUST BE LOWER THAN FOUNDATIONS, INCLUDING BASEMENTS WITHIN 10 FEET OF THE SOAKAGE TRENCH.

SECTION



LINE TRENCH SIDES WITH PERMEABLE FILTER FABRIC AS SHOWN, ADD 18" OF DRAIN ROCK. PLACE PERF. PIPE AND COVER ALL.

CONSTRUCTION REQUIREMENTS

THE OUTLINE OF THE FACILITY MUST BE CLEARLY MARKED BEFORE SITE WORK BEGINS TO AVOID SOIL DISTURBANCE. USE OF HEAVY EQUIPMENT SHOULD BE MINIMIZED WITHIN 10 FEET OF SOAKAGE TRENCH AREAS. THE BOTTOM OF THE SOAKAGE TRENCH AND THE PERFORATED PIPE MUST BE LEVEL. CLAY CHECK DAMS MAY BE USED TO PREVENT WATER FROM COLLECTING NEAR THE DOWNSTREAM END. SMEARING THE SOIL SURFACE DURING EXCAVATION CAN POTENTIALLY LIMIT INFILTRATION RATES; IF SMOOTH EXCAVATION TOOLS ARE USED, ROUGHEN THE SIDES AND BOTTOM OF THE EXCAVATION WITH A SHARP POINTED TOOL. REMOVE LOOSE MATERIAL FROM THE BOTTOM OF THE EXCAVATION.



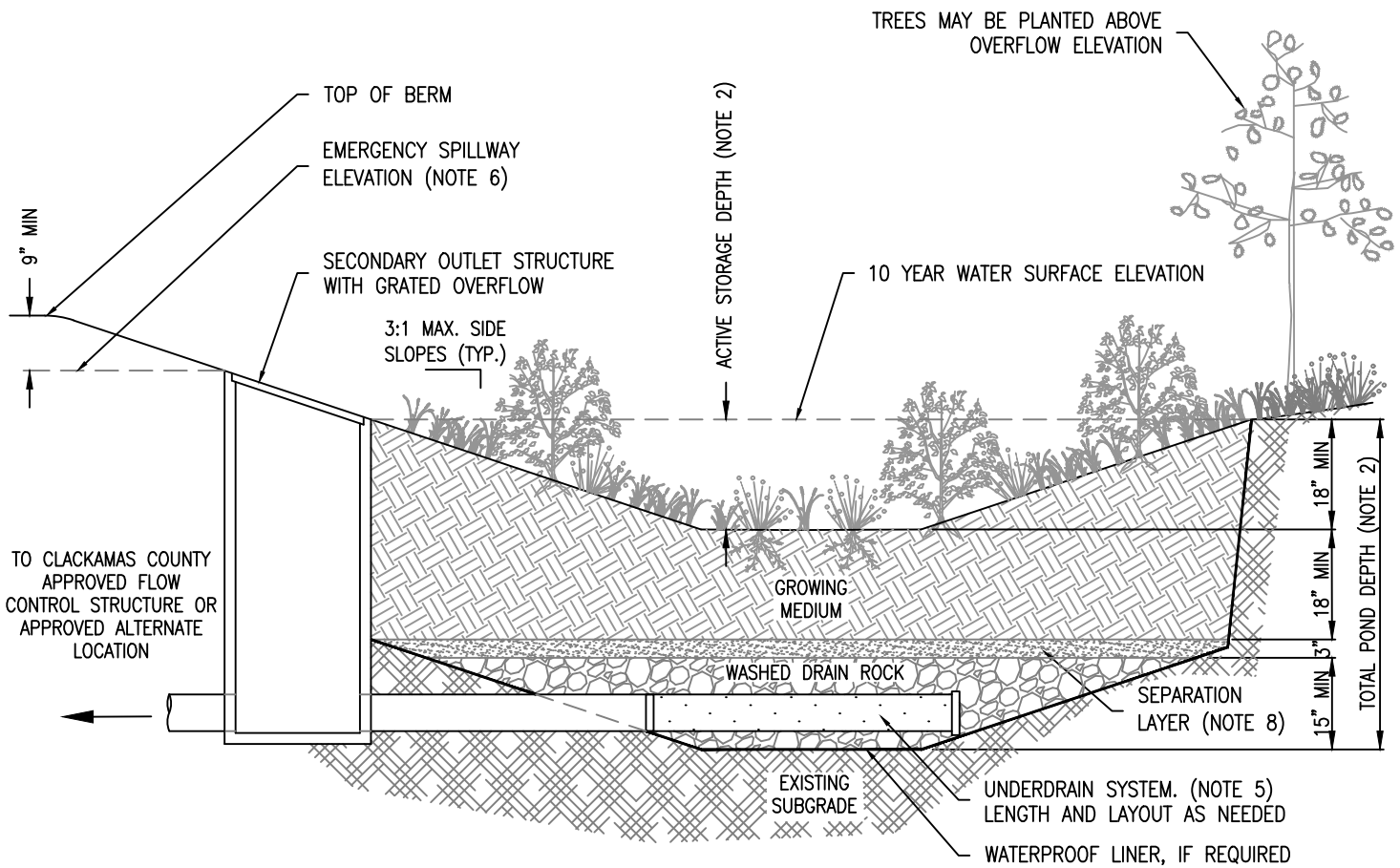
STORMWATER STANDARD DRAWING

SOAKAGE TRENCH

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DATE: 4/10/2024
SCALE: NTS



NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED PONDS ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION
2. DIMENSIONS:
 - ACTIVE STORAGE DEPTH (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): PER FACILITY SIZING MODEL
 - TOTAL POND DEPTH: 4" MINIMUM, PER FACILITY SIZING MODEL
 - BOTTOM SLOPE: 2.0% OR LESS OF
3. -SIDE SLOPE OF DETENTION POND: 3:1 MAXIMUM
4. DETENTION POND MUST BE SETBACK A MINIMUM OF 10 FEET FROM FOUNDATIONS AND 5 FEET FROM PROPERTY LINE.
5. PERFORATED UNDERDRAIN PIPING SHALL BE A MINIMUM OF 6" DIAMETER AND MATERIAL SHALL BE ABS SCH. 40, DUCTILE IRON, OR PVC SCH. 40. PIPING MUST HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC PIPING NOT ALLOWED ABOVE GROUND.
6. EMERGENCY SPILLWAY TO BE SIZED TO CONVEY THE 100 YEAR DESIGN STORM. PROVIDE 6" MINIMUM FREEBOARD ABOVE THE 100-YEAR DESIGN STORM.
7. DRAIN ROCK SIZE: 1 1/2" - 3/4" WASHED WITH 15" DEPTH.
8. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
9. GROWING MEDIUM WILL BE A MINIMUM 18" DEPTH.
10. VEGETATION WILL FOLLOW THE LANDSCAPE PLANS.
11. WATERPROOF LINE, IF REQUIRED, SHALL BE 30 MIL PVC OR EQUIVALENT FOR DETENTION POND.
12. SEASONAL HIGH GROUNDWATER SEPARATION DISTANCE AS REQUIRED.

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OAK LODGE

WATER SERVICES

SEWER SYSTEM STANDARD DRAWING INDEX

STANDARD DRAWINGS

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NOTES:

1. CONSTRUCTION OF IMPROVEMENTS SHALL BE IN ACCORDANCE WITH OAK LODGE WATER SERVICES (OLWS a.k.a. DISTRICT) DEVELOPER EXTENSION AGREEMENT (as applicable), DISTRICT STANDARD DETAILS AND THE OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, MOST CURRENT EDITION, AS ISSUED BY THE OR. STATE DEPT. OF TRANSPORTATION.
2. A PRE-CONSTRUCTION CONFERENCE IS REQUIRED PRIOR TO CONSTRUCTION AND 48 HOURS ADVANCE NOTIFICATION OF THE LOCAL MUNICIPALITY, OLWS AND ALL AFFECTED UTILITY COMPANIES PRIOR TO THE ACTUAL START OF WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE PROVISIONS OF THE ROAD OPENING PERMIT AS ISSUED BY CLACKAMAS COUNTY.
4. LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY, LOCATE AND PROTECT ALL UTILITIES WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION. SHOW THESE UTILITIES ON THE AS-BUILTS. IF A UTILITY IS DAMAGED, THE CONTRACTOR SHALL NOTIFY THE AFFECTED UTILITY COMPANY IMMEDIATELY.
5. SANITARY MAIN TRENCH SECTION AND ALL EXCAVATED AREAS SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH THE STANDARD DETAILS, THE ROAD OPENING PERMIT, AND WITH SECTION 01140.40 OF THE STANDARD SPECIFICATIONS. COMPACTION TESTING SHALL BE REQUIRED DURING BACKFILLING OPERATIONS WITHIN ALL ROADWAYS AND AT THE DISCRETION OF THE DISTRICT. IF TRENCH BACKFILL DOES NOT MEET COMPACTION REQUIREMENTS, CONTRACTOR SHALL EXCAVATE, RECOMPACT AND RETEST MATERIAL AT CONTRACTOR'S EXPENSE.
6. RESTORATION OF DAMAGED ROAD SURFACING SHALL BE IN ACCORDANCE WITH CLACKAMAS COUNTY REQUIREMENTS. ALL OTHER AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR AS DIRECTED BY THE DISTRICT. THIS INCLUDES SHOULDERS, LANDSCAPING, WALLS, DRIVEWAYS, FENCES AND OTHER IMPROVEMENTS.
7. POLYVINYL CHLORIDE PIPE (PVC) SHALL CONFORM TO THE REQUIREMENTS OF ASTM D-3034, SDR 35, AND JOINT TYPE SHALL BE ELASTOMERIC GASKET CONFORMING TO ASTM D-3212.
8. MANHOLES TO BE PRECAST CONCRETE SECTIONS WITH MINIMUM INSIDE DIAMETER OF 48-INCHES, CONFORMING TO THE REQUIREMENTS OF ASTM C-478, EXCEPT AS NOTED ON THE PLANS.
9. POLYVINYL CHLORIDE PIPE (PVC) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS. PVC SEWER PIPE SHALL BE CONNECTED TO CONCRETE MANHOLES BY MEANS OF A KOR-N-SEAL BOOT (OR EQUIVALENT). SAND COLLARS WILL NOT BE ACCEPTED.
10. AFTER THE CONTRACTOR HAS BACKFILLED THE PIPE ZONE OF THE TRENCH AS REQUIRED, HE SHALL THEN BACKFILL THE BALANCE OF THE TRENCH, WITH THE TYPE OF BACKFILL SPECIFIED, IN ONE FOOT (1') LAYERS, MECHANICALLY COMPACTING EACH LAYER TO 95% OF MAXIMUM DENSITY IN ROADWAYS AND 85% TO 90% IN ALL OTHER AREAS. MAXIMUM RELATIVE DENSITY SHALL BE DETERMINED PER AASHTO T-180. IN PLACE, DENSITY SHALL BE DETERMINED PER AASHTO T-191, T-205 OR T-238. ANY SUBSEQUENT SETTLEMENT OF THE TRENCH OR DITCH DURING THE GUARANTEE PERIOD SHALL BE CONSIDERED TO BE THE RESULT OF IMPROPER COMPACTION AND SHALL BE PROMPTLY CORRECTED BY THE CONTRACTOR AT NO EXPENSE TO THE DISTRICT OR THE OWNER.
11. SANITARY SEWER PIPE AND APPURTENANCES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH OLWS STANDARDS. LEAKAGE TESTS INCLUDE AN AIR TEST OF THE SEWER MAINS AND SERVICE CONNECTIONS AND VACUUM TEST OF THE MANHOLES. ANY PORTION OF THE SEWER WHICH FAILS TO PASS THESE TESTS SHALL BE EXCAVATED, REPAIRED OR REALIGNED, AND RETESTED. IN ADDITION TO LEAKAGE TESTING, SANITARY SEWERS CONSTRUCTED OF PVC SEWER PIPE SHALL BE DEFLECTION TESTED AFTER THE TRENCH BACKFILL AND COMPACTION HAS BEEN COMPLETED. THE TEST SHALL BE CONDUCTED BY PULLING AN APPROVED SOLID POINTED MANDREL 95% OF THE INSIDE DIAMETER THROUGH THE PIPELINE ON A MANHOLE TO MANHOLE BASIS. IN ADDITION, ALL MAIN LINES MUST BE VIDEO INSPECTED, AND A VIDEO RECORD ON A FLASH DRIVE MUST BE SUBMITTED TO OLWS. NOTE THAT ALL TESTS AND THE VIDEO INSPECTIONS MUST BE PERFORMED IN THE PRESENCE OF THE OLWS INSPECTOR.
12. UNLESS OTHERWISE SPECIFIED ON THE PLANS OR DIRECTED BY THE ENGINEER, EACH SERVICE CONNECTION SHALL BE LAID IN A SEPARATE TRENCH ON A STRAIGHT LINE AND GRADIENT FROM THE TEE TO THE END OF THE SERVICE CONNECTION. THE SERVICES CONNECTION SHALL BE INSTALLED PERPENDICULAR TO THE MAIN LINE AND MUST HAVE A MINIMUM OF 5 FEET OF COVER IN ALL PARTS OF THE ROAD RIGHT OF WAY AND UTILITY EASEMENT. NO SERVICE CONNECTION SHALL BE LAID ON A SLOPE OF LESS THAN TWO PERCENT, UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR SHOWN ON THE PLANS. THE ENGINEER WILL PROVIDE A CUT STAKE AT THE TERMINAL POINT OF EACH SERVICE CONNECTION. THE CONTRACTOR WILL USE A PIPE LASER TO ACHIEVE CORRECT GRADE AND ALIGNMENT. EACH SERVICE CONNECTION SHALL BE PLUGGED WITH A RUBBER RING PLUG. A 2 X 4 MARKER PAINTED GREEN SHALL BE PLACED AT THE END OF EACH SERVICE CONNECTION, AND SHALL EXTEND FROM THE END OF THE PIPE TO A POINT THREE FEET (3') OR MORE ABOVE THE SURFACE OF THE GROUND. A DETECTABLE GREEN MAGNETIC TAPE WITH THE WORD "SEWER" AT REGULAR INTERVALS SHALL BE PLACED ALONG THE SERVICE CONNECTION FROM THE MAINLINE TEE TO THE GROUND SURFACE. EACH SERVICE CONNECTION MUST HAVE A CLEAN OUT WITH A TRAFFIC-RATED BOX LOCATED AT THE EDGE OF THE ROAD RIGHT-OF-WAY OR UTILITY EASEMENT.
13. IN EASEMENT AREAS ALL MANHOLES SHALL HAVE TAMPER-PROOF LIDS PER OLWS SPECIFICATIONS, OR APPROVED EQUAL. IN EASEMENT AREAS MANHOLE FRAMES SHALL BE INSTALLED A MINIMUM OF 6" ABOVE THE SURROUNDING GRADE.
14. THE CONTRACTOR SHALL AT ALL TIMES PROVIDE AND MAINTAIN AMPLE MEANS AND DEVICES TO REMOVE AND DISPOSE OF ALL WATER ENTERING THE TRENCH EXCAVATION DURING THE PROCESS OF LAYING THE PIPE. WATER AND DEBRIS SHALL NOT ENTER INTO THE DISTRICT'S SEWER SYSTEM. WATER AND DEBRIS SHALL BE DISPOSED OF IN AN APPROVED MANNER.
15. THERE MUST BE A MINIMUM OF 5 FEET OF CLEAR HORIZONTAL SEPARATION BETWEEN A WATER MAIN AND A SANITARY LINE. THERE MUST BE A MINIMUM OF 5 FEET OF CLEAR HORIZONTAL SEPARATION BETWEEN A WATER SERVICE AND A SANITARY LINE.



SANITARY SYSTEM STANDARD DRAWING

**SANITARY SEWER
CONSTRUCTION NOTES**

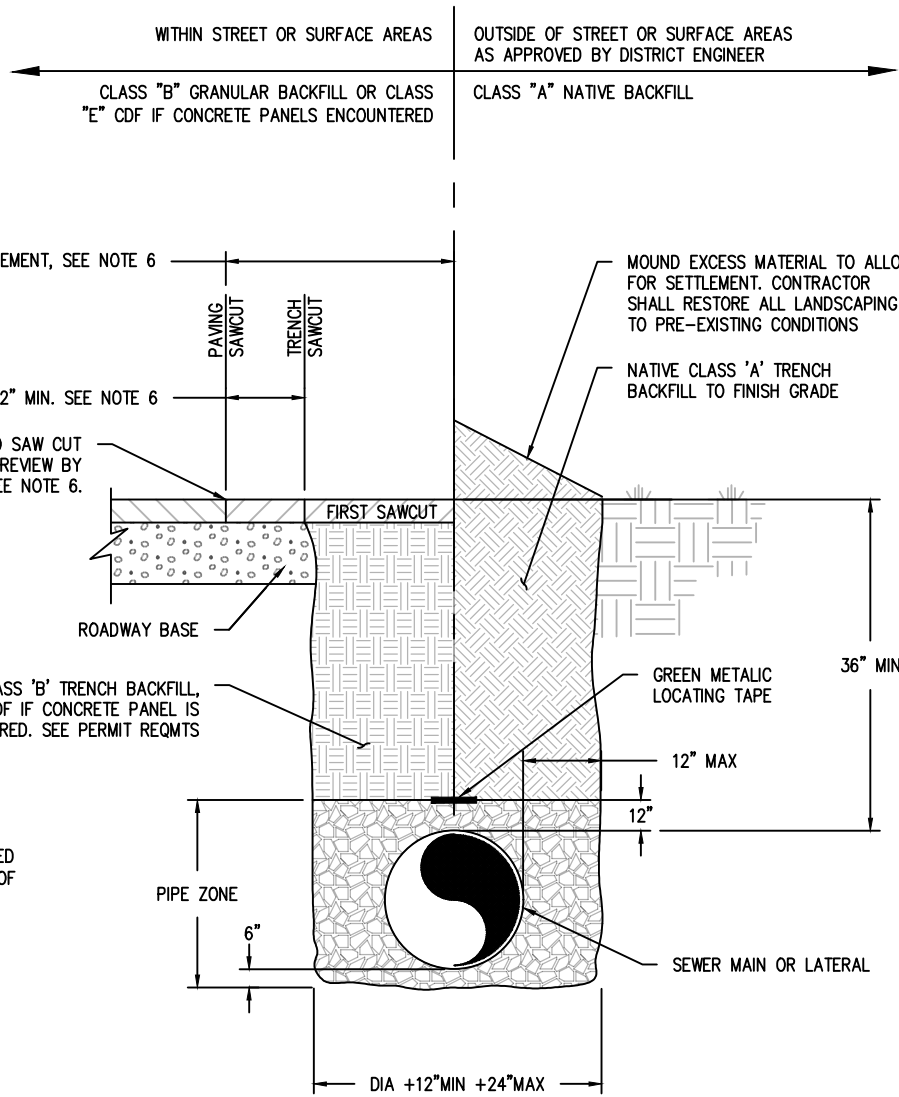
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DATE: 9/12/2017

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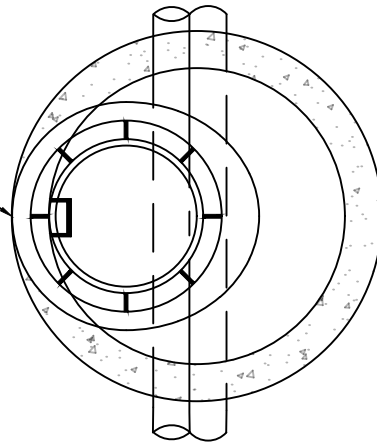


NOTES:

1. PIPE ZONE MATERIAL SHALL BE 3/4"-0" CRUSHED ROCK GRANULAR BACKFILL COMPACTED TO 95% OF AASHTO T-99.
2. CLASS "A" NATIVE BACKFILL MAY ONLY BE USED OUTSIDE OF PAVED AREAS AND REQUIRES OLWS APPROVAL. BACKFILL SHALL BE COMPACTED TO 90% OF AASHTO T-99 IN LIFTS NOT EXCEEDING 18" (LOOSE MEASURE).
3. CLASS "B" 3/4"-0" CRUSHED ROCK GRANULAR BACKFILL SHALL BE USED WITHIN PAVED AREAS. BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-99.
4. BACKFILL SHALL BE PLACED AND COMPACTED IN A MAXIMUM OF 24-INCH LIFTS. COMPACTION TESTING REQUIRED AT A FREQUENCY OF 1 TEST EVERY 100 FEET OF TRENCH.
5. RESURFACING TO BE MINIMUM 4 INCHES 1/2-INCH LEVEL 2 HMAC (PG 64-22) OR MATCH EXISTING, WHICHEVER IS GREATER.
6. SAWCUT WIDTH AND AC PAVEMENT REPLACEMENT SHALL BE PER APPLICABLE JURISDICTIONAL REQUIREMENTS. SAWCUT CLEAN EDGE FOR AC PAVEMENT REPLACEMENT. SAND SEAL JOINT.
7. PROVIDE CLASS "E" CDF BACKFILL FOR ALL TRENCH CROSSINGS LOCATED IN VEHICLE TRAVEL LANES OF ARTERIAL & COLLECTOR STREETS, OR WHERE CONCRETE PANELS ARE ENCOUNTERED. IF THESE SPECIFICATIONS CONFLICT WITH THE SPECIFICATIONS OF ANOTHER APPLICABLE JURISDICTION, THE MORE STRINGENT SPECIFICATION SHALL GOVERN.

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LOCATE FRAME AND COVER OVER LEDGE OF AT LEAST 12" IN WIDTH

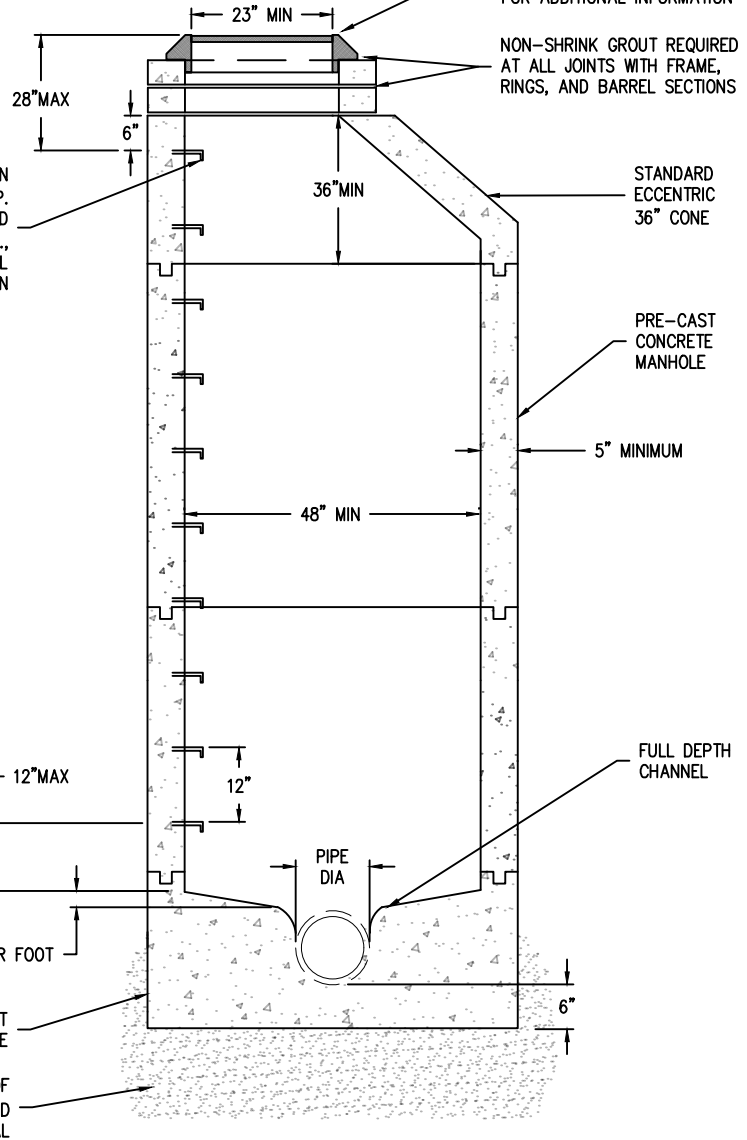


PLAN

MANHOLE FRAME MUST BE FLUSH WITH ROADWAY WITHOUT THE USE OF PAVING RINGS, SEE NOTE 5 FOR ADDITIONAL INFORMATION

NON-SHRINK GROUT REQUIRED AT ALL JOINTS WITH FRAME, RINGS, AND BARREL SECTIONS

POLYETHYLENE STEPS W/ IRON REINFORCEMENT, 8"x12" WIDE, 2" DROP. LOCATE FIRST STEP OVER SHELF AND INSTALL W/ 3" IMBED AT 12" O.C., TYP., U.N.O., SEE NOTE 6 FOR ADDITIONAL INFORMATION

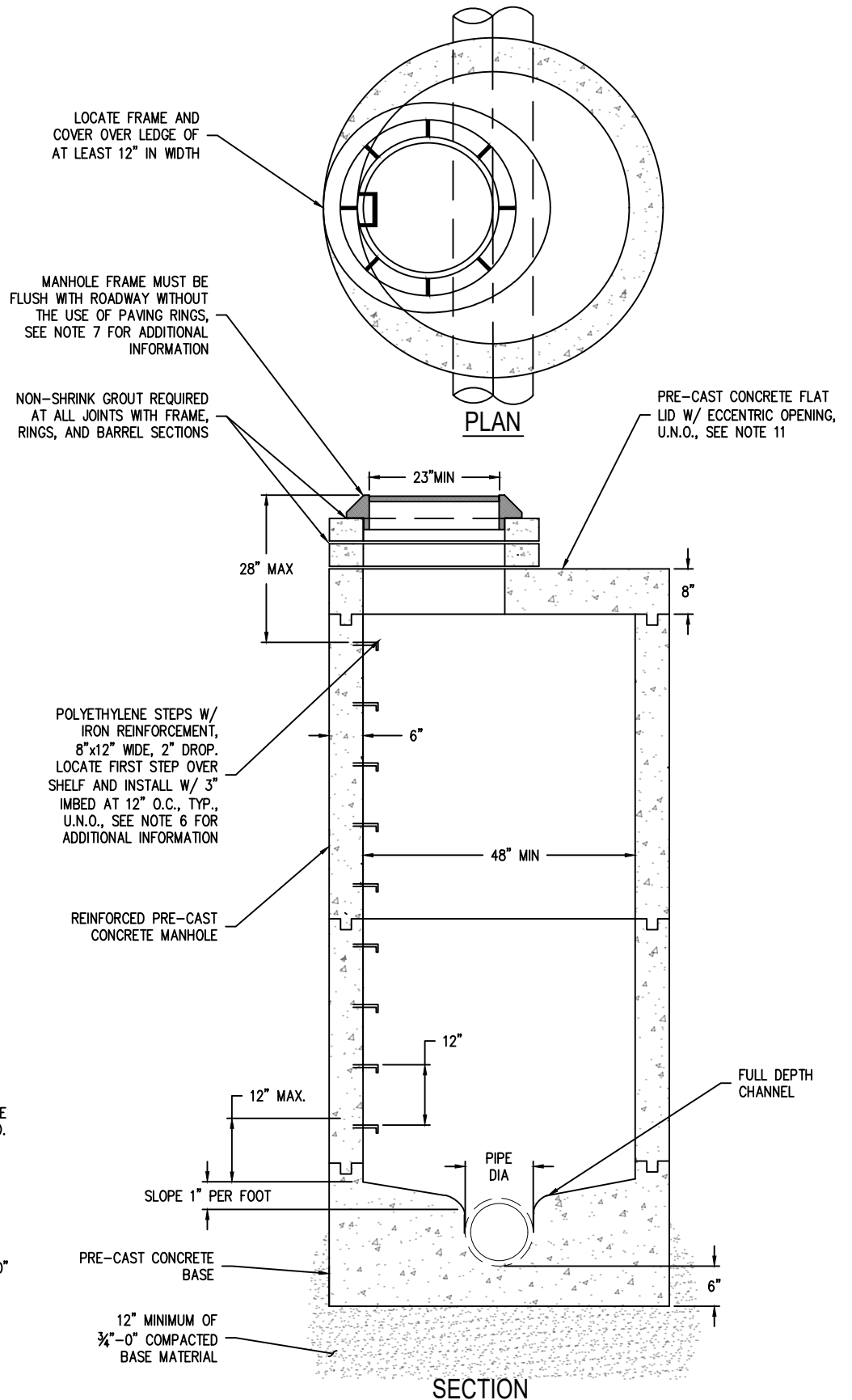


SECTION

NOTES:

1. MANHOLE LID TO BE FLUSH WITH ROADWAY OR 6" ABOVE FINISH GRADE IN EASEMENTS UNLESS OTHERWISE SPECIFIED.
2. SHELF SHALL NOT BE BELOW THE SPRING LINE OF THE PIPE.
3. STRUCTURE OPENINGS TO BE PRE-CAST OR CORE DRILLED ONLY.
4. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
5. ALL JOINTS AND RUBBER GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-443.
6. STEPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478. MANHOLE STEPS MUST BE TIGHT AND FIRMLY EMBEDDED. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN, TYPE, AND (MIXING OF UNMATCHED STEPS IS NOT PERMITTED). MANHOLES UNDER 3' DEEP DO NOT REQUIRE STEPS.
7. ALL PIPE CONNECTIONS TO MANHOLE SHALL BE WATERTIGHT.
8. CHANNEL MUST HAVE A MINIMUM OF 0.2' DROP BETWEEN INLET AND OUTLET.
9. CHANNELS MUST BE ABLE TO PASS A 7"x30" CYLINDER INTO PIPES.

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NOTES:

1. FLAT TOP IS REQUIRED WHEN HEIGHT FROM SHELF TO TOP OF LAST BARREL SECTION IS 4' OR LESS.
2. SHELF SHALL NOT BE BELOW THE SPRING LINE OF THE PIPE.
3. STRUCTURE OPENINGS TO BE PRE-CAST OR CORE DRILLED ONLY.
4. ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
5. ALL JOINTS AND RUBBER GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-443.
6. STEPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478. MANHOLE STEPS MUST BE TIGHT AND FIRMLY EMBEDDED. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN, TYPE, AND (MIXING OF UNMATCHED STEPS IS NOT PERMITTED.) MANHOLES UNDER 3' DEEP DO NOT REQUIRE STEPS.
7. MANHOLE LID TO BE 6" ABOVE FINISH GRADE IN EASEMENTS UNLESS OTHERWISE SPECIFIED.
8. ALL PIPE CONNECTIONS TO MANHOLE SHALL BE WATERTIGHT.
9. CHANNEL MUST HAVE A MINIMUM OF 0.2' DROP BETWEEN INLET AND OUTLET.
10. CHANNELS MUST BE ABLE TO PASS A 7"x30" CYLINDER INTO PIPES.
11. CONCENTRIC LID REQUIRED WHEN HEIGHT FROM SHELF TO TOP OF LAST BARREL SECTION IS 3' OR LESS.

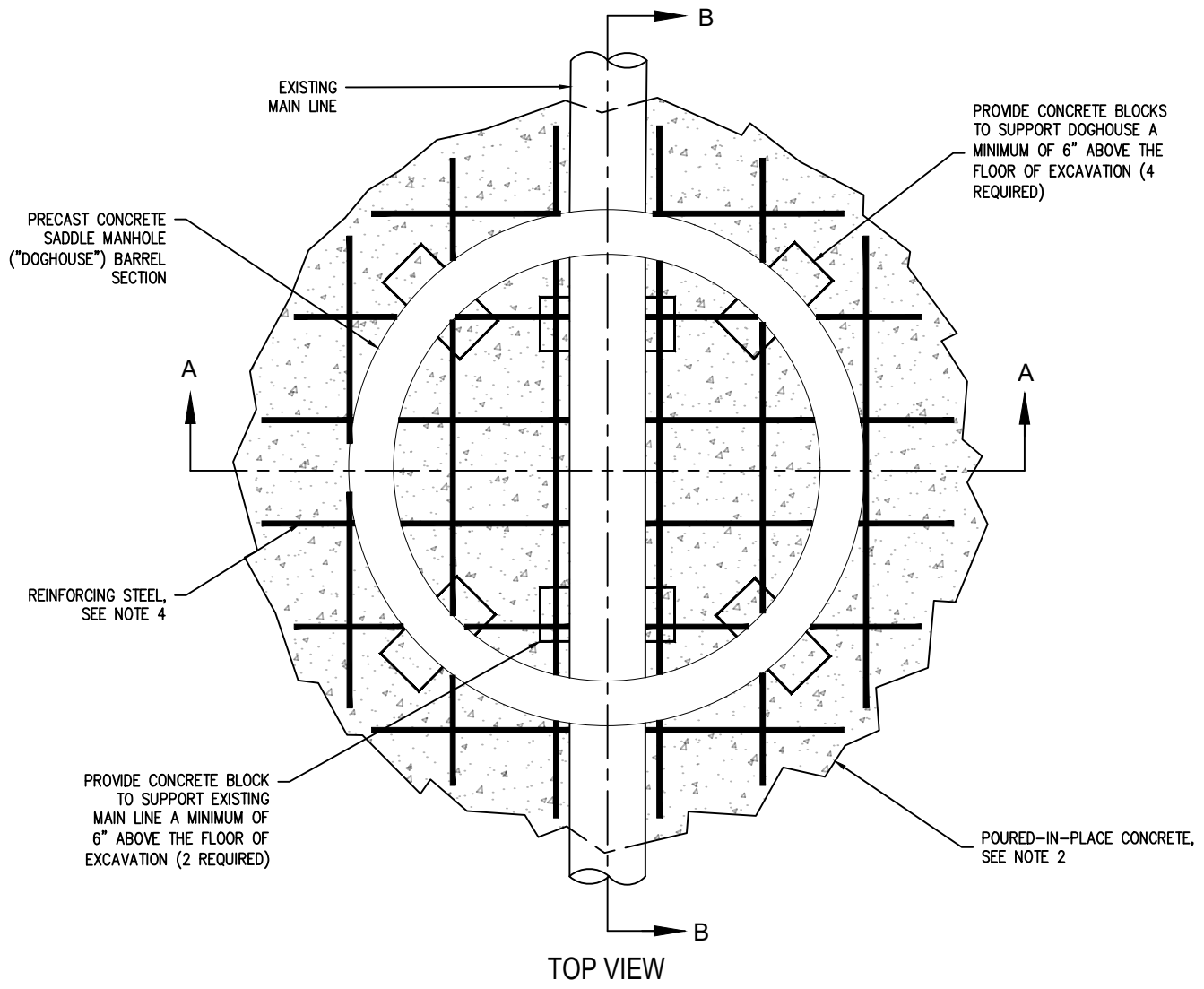
POLYETHYLENE STEPS W/ IRON REINFORCEMENT, 8"x12" WIDE, 2" DROP. LOCATE FIRST STEP OVER SHELF AND INSTALL W/ 3" IMBED AT 12" O.C., TYP., U.N.O., SEE NOTE 6 FOR ADDITIONAL INFORMATION

REINFORCED PRE-CAST CONCRETE MANHOLE

PRE-CAST CONCRETE BASE

12" MINIMUM OF 3/4"-0" COMPACTED BASE MATERIAL

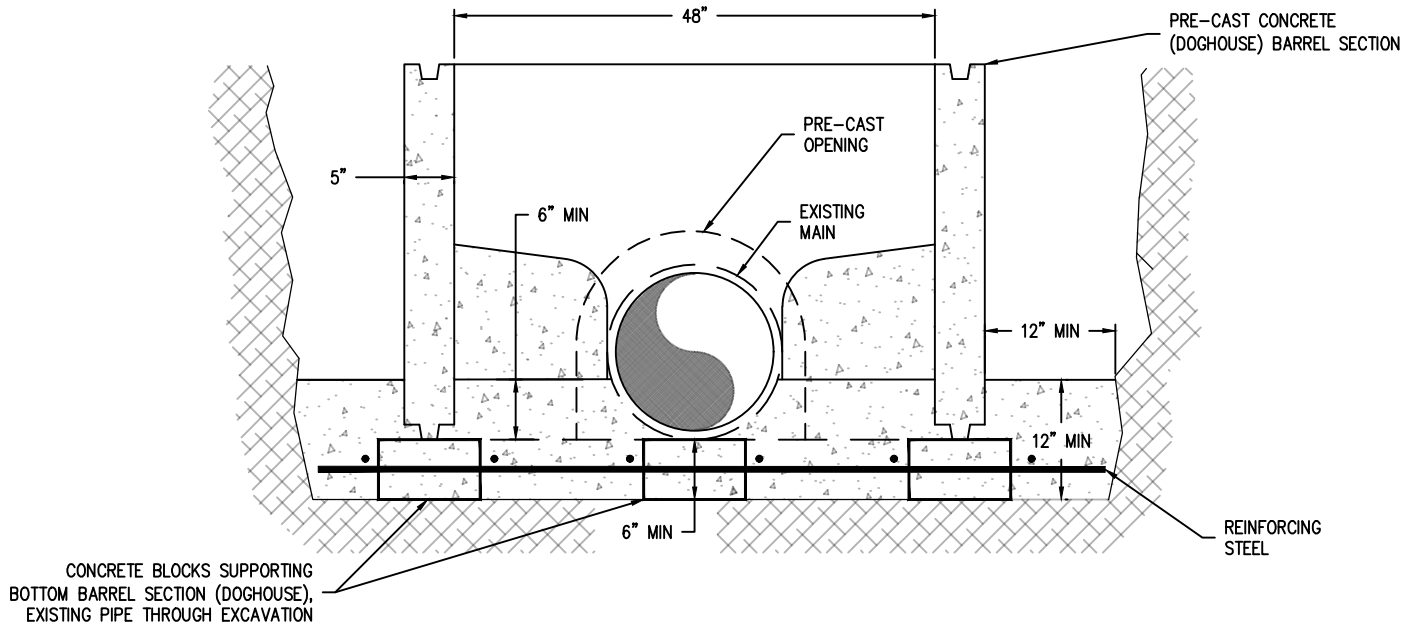
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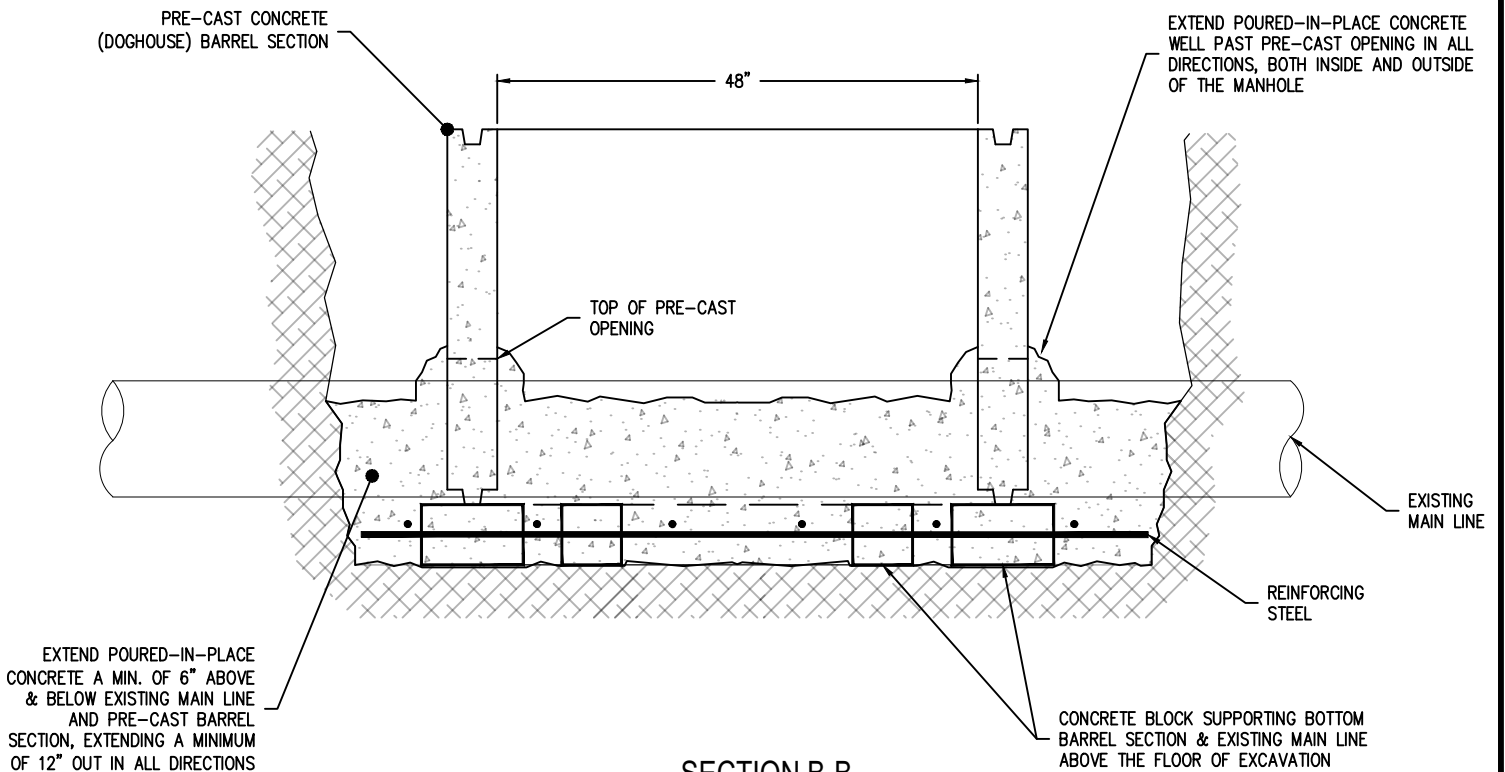
TOP VIEW

1. POURED-IN-PLACE BASE IS ALLOWED ONLY FOR NEW MANHOLES CONSTRUCTED OVER EXISTING MAIN LINES. ALL OTHER MANHOLE BASES MUST BE PRE-CAST UNITS.
2. A MINIMUM OF 6" OF POURED-IN-PLACE CONCRETE MUST BE PROVIDED UNDER ALL PARTS OF THE EXISTING MAIN AND UNDER THE BOTTOM OF THE DOGHOUSE. THIS CONCRETE MUST EXTEND 12" OUTSIDE OF THE MANHOLE WALL IN ALL DIRECTIONS AND MUST EXTEND 6" ABOVE THE BOTTOM OF THE DOGHOUSE BOTH INSIDE AND OUTSIDE THE MANHOLE.
3. THE POURED CONCRETE MUST HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD AND MEET A MINIMUM 3000 psi COMPRESSION TEST AFTER 28 DAYS.
4. REINFORCING SHALL BE #5 REBAR AT 12" ON CENTER, EACH WAY, OR TWO (2) MATS OF 6 x 6 x 10 GAUGE SHEET MESH. CENTER REINFORCING WITHIN POURED-IN-PLACE CONCRETE SLAB WITH 3" COVER.
5. THE DIAMETER OF THE PRE-CAST OPENINGS IN THE DOGHOUSE CAN BE NO MORE THAN 6" GREATER THAN THE OUTSIDE DIAMETER OF THE EXISTING MAIN. THE DOGHOUSE SHALL BE PLACED SO THAT THE EXISTING MAIN IS CENTERED IN THE OPENING.
6. IF THE EXISTING MAIN IS PVC OR HDPE, SANDED COLLARS MUST BE INSTALLED ON THE MAIN AND CENTERED IN THE PRE-CAST OPENINGS.
7. PIPE CONNECTIONS MUST BE MADE TO THE PRE-CAST OR CORED HOLES WITH KOR-N-SEAL BOOTS OR EQUIVALENT WHENEVER POSSIBLE. SANDED COLLARS WILL BE ACCEPTED ONLY WHEN THEY ARE POURED INTO THE MANHOLE BASE.
8. THE ANNULAR SPACES BETWEEN THE EXISTING MAIN AND THE PRE-CAST OPENINGS MUST BE FILLED WITH CONCRETE WHICH EXTENDS WELL BEYOND THE OPENINGS IN ALL DIRECTIONS, BOTH INSIDE AND OUTSIDE OF THE MANHOLE.
9. NOTE THAT THE TOP OF EXISTING MAIN IS NOT TO BE "CUT OUT" UNTIL A MANHOLE VACUUM TEST HAS BEEN WITNESSED AND APPROVED BY THE OLWS INSPECTOR. THE OPENING IN THE PIPE IS TO BE NEATLY FINISHED AND SHALL BE SIZED TO ALLOW A 7" x 30" CYLINDER TO PASS INTO ALL PIPES.

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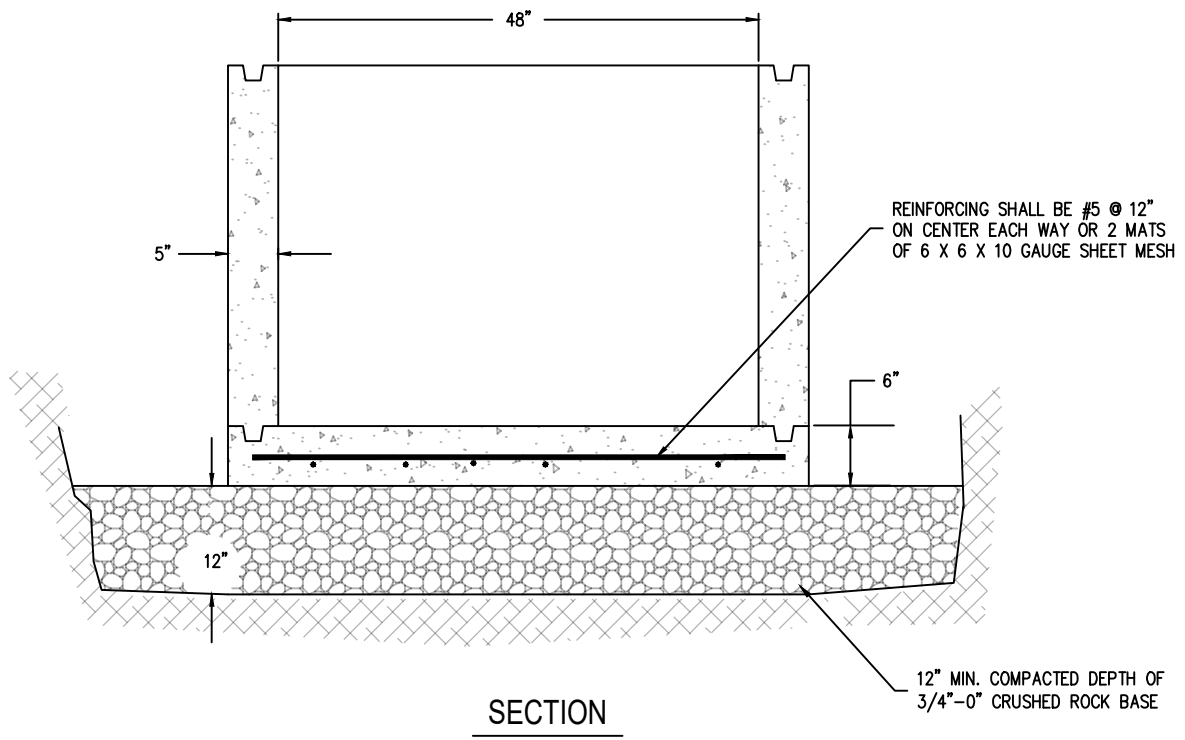


SECTION A-A



SECTION B-B

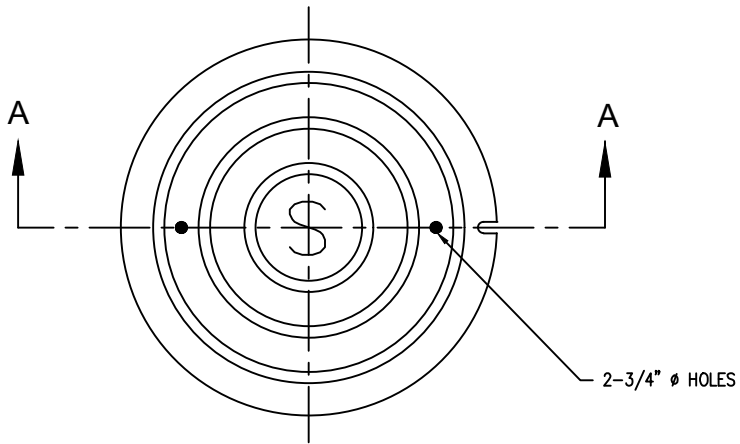
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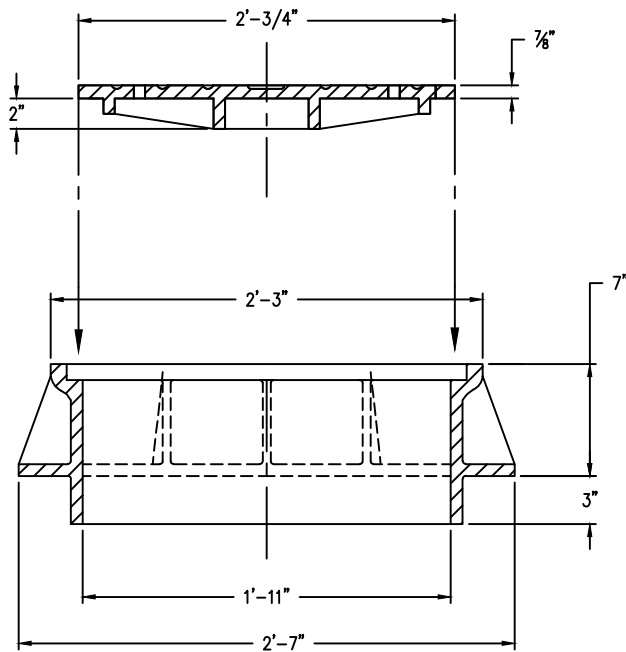
NOTES:

1. ALL MANHOLE BASE SECTIONS SHALL BE PRE-CAST CONCRETE, EXCEPT THOSE LOCATED OVER EXISTING MAIN LINES.
2. PIPE CONNECTIONS MUST BE MADE TO PRE-CAST OR CORED HOLES WITH A KOR-N-SEAL BIT OR EQUIVALENT. SANDED COLLARS ARE NOT ACCEPTABLE.

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TOP VIEW



SECTION A-A

NOTES:

1. STANDARD FRAME AND COVER TO BE USED ON COLLECTOR, ARTERIAL, AND INDUSTRIAL STREETS OR AS NOTED ON CONSTRUCTION PLANS.
2. SANITARY COVER WILL HAVE TWO 3/4" \emptyset HOLES.

OAK LODGE
 WATER SERVICES

FRAME & COVER (STANDARD)

DRAWING NO.

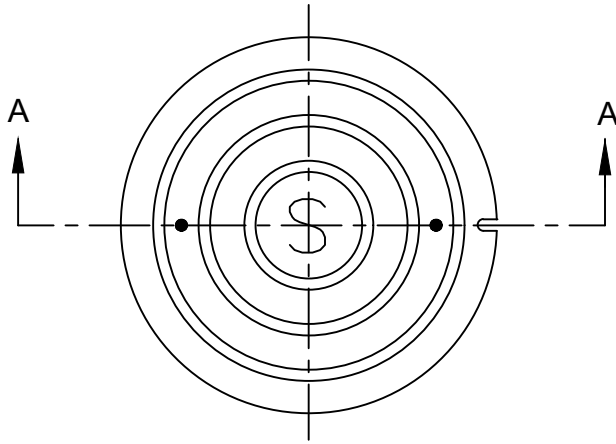
308

SANITARY SYSTEM STANDARD DRAWING

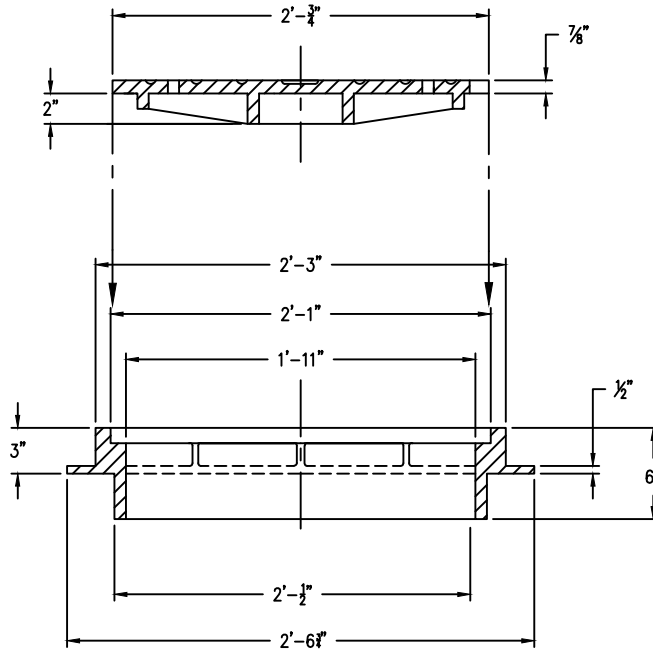
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DATE: 09/12/2017

SCALE: NTS



TOP VIEW



SECTION A-A

NOTES

1. COVER AND FRAME SHALL BE OF GRAY CAST IRON
A.S.T.M. A-48 CLASS 30
2. SUBURBAN FRAME & COVER CAN BE USED IN
EASEMENTS AND SUBDIVISION STREETS EXCEPT
COLLECTOR, ARTERIAL, AND INDUSTRIAL STREETS, OR
AS NOTED ON CONSTRUCTION PLANS.
3. SANITARY COVER WILL HAVE TWO 3/4" Ø HOLES.

OAK LODGE
WATER SERVICES

SANITARY SYSTEM STANDARD DRAWING

FRAME & COVER (SUBURBAN)

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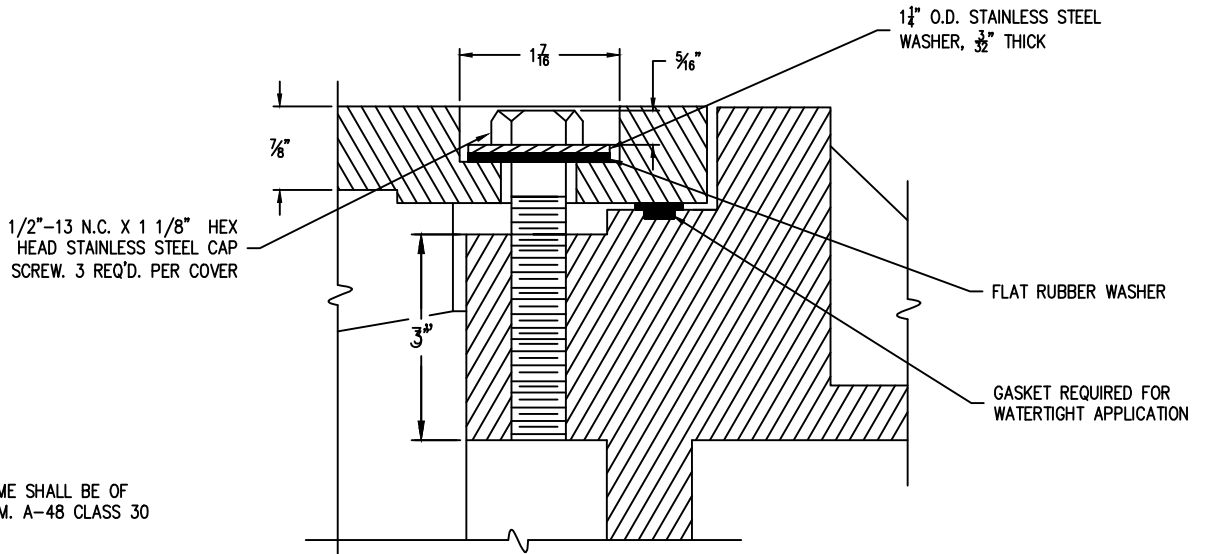
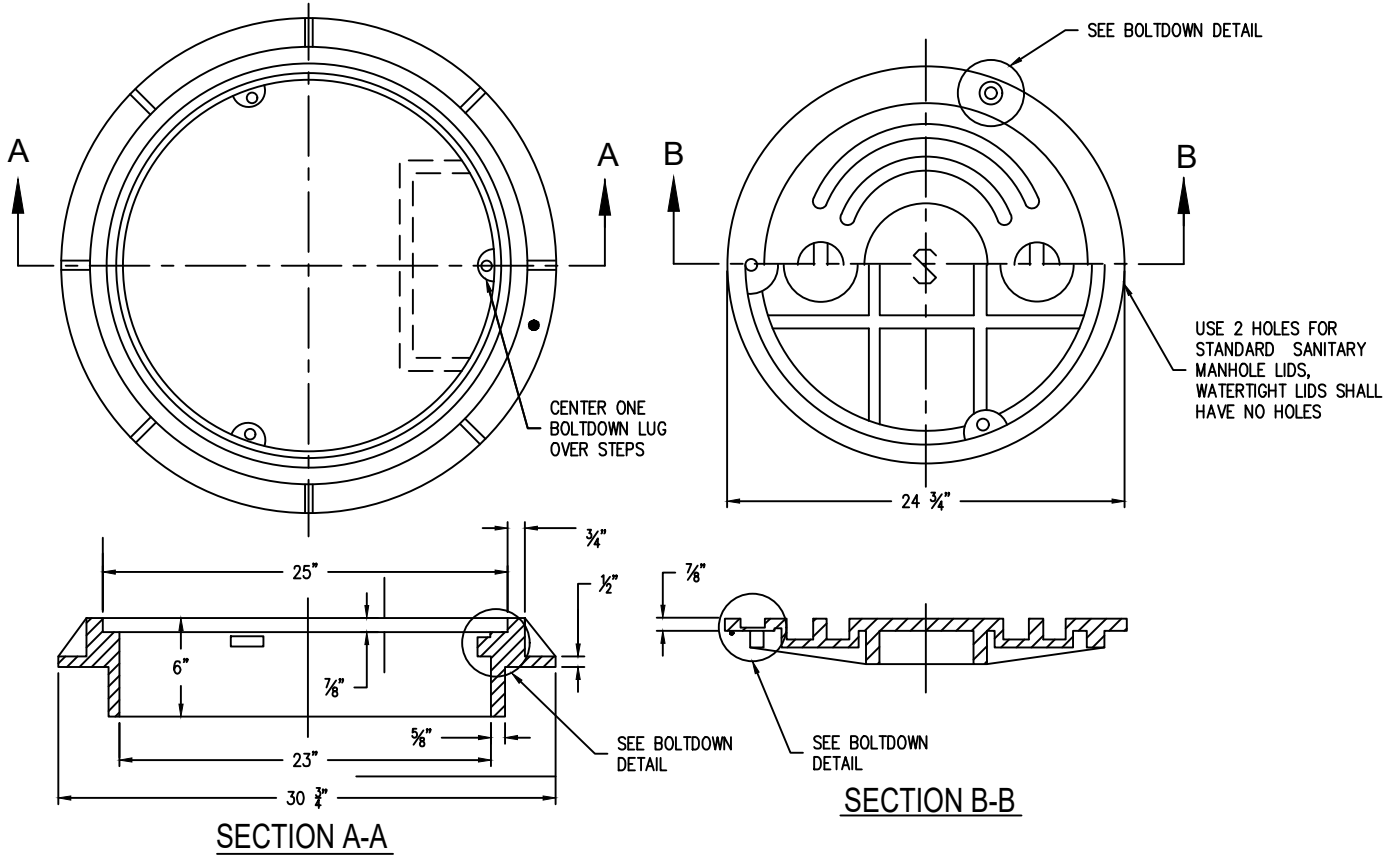
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DATE: 09/12/2017

SCALE: NTS

TAMPERPROOF MANHOLE RING

3-BOLTDOWN COVER



NOTE: COVER AND FRAME SHALL BE OF GRAY CAST IRON A.S.T.M. A-48 CLASS 30

BOLT-DOWN DETAIL

OAK LODGE

WATER SERVICES

SANITARY SYSTEM STANDARD DRAWING

FRAME & COVER (SECURE / WATERTIGHT)

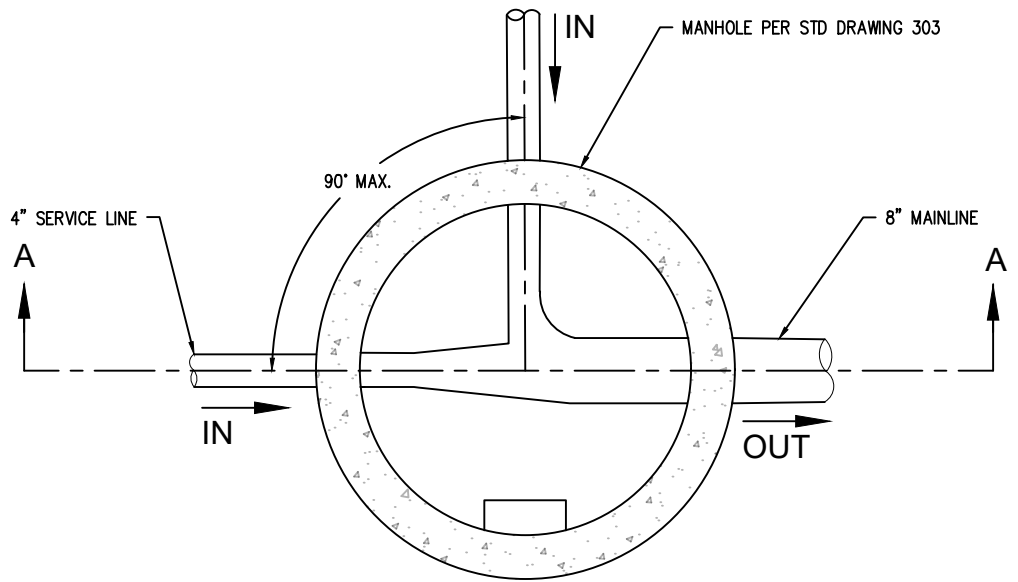
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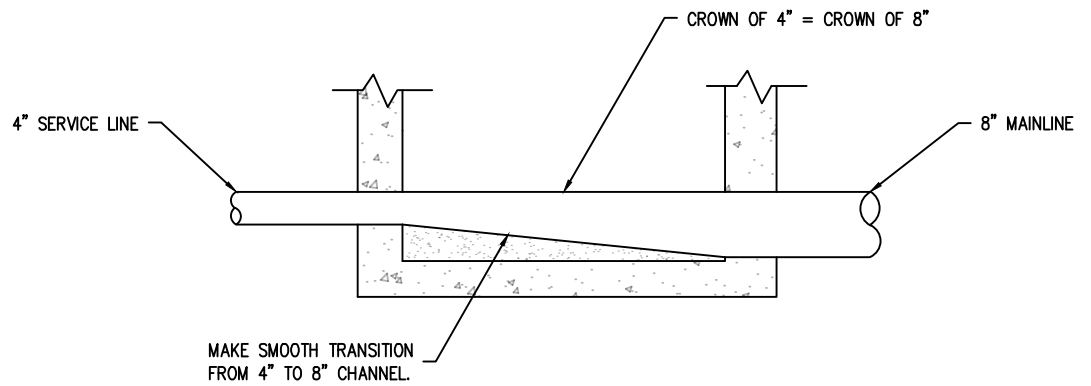
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DATE: 09/12/2017

SCALE: NTS



PLAN



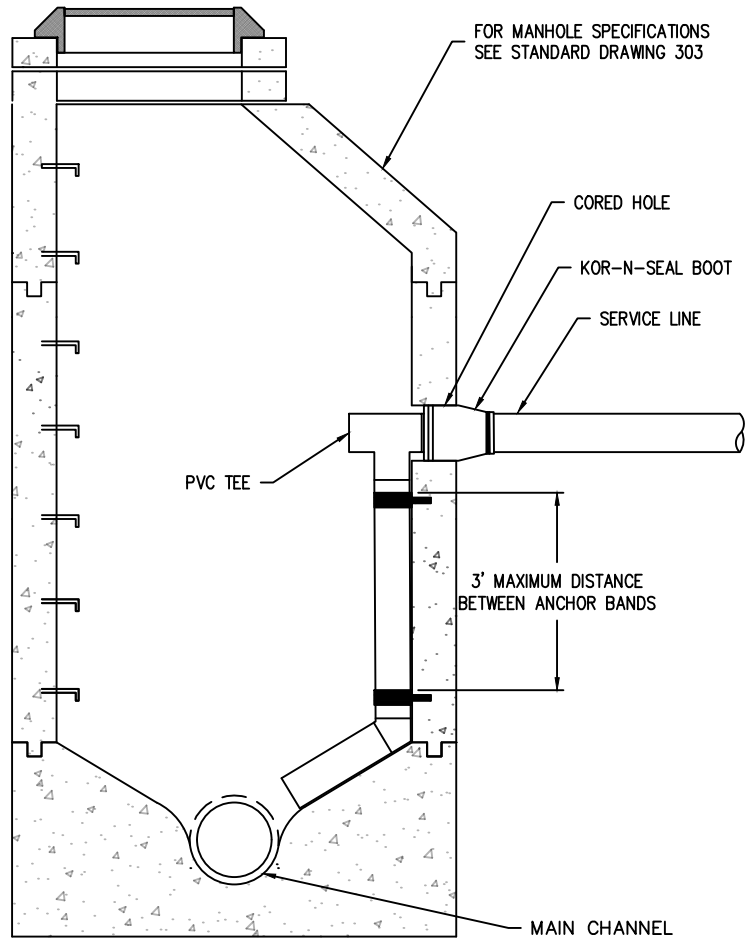
SECTION A-A

NOTES:

1. CHANNEL MANHOLE TO MATCH INLET & OUTLET PIPE DIAMETERS & PROVIDE SMOOTH TRANSITION.
2. MATCH CROWN OF INLET & OUTLET PIPES & CHANNELIZATION.

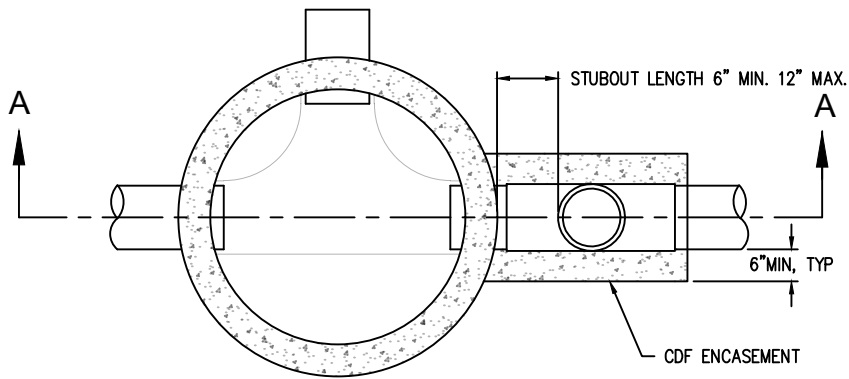
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1. OLWS MAY ALLOW INSIDE DROP SERVICE CONNECTIONS AT THE DISCRETION OF THE DISTRICT ENGINEER.
2. INSIDE DROPS MAY BE 4" OR 6" & SHALL BE SIZED TO MATCH THE INFLOW PIPE.
3. THE ENTRY POINT IN THE MANHOLE WALL MUST BE CORE DRILLED.
4. THE SERVICE LATERAL IS TO BE SEALED INTO THE CORED HOLE WITH A KOR-N-SEAL BOOT OR EQUIVALENT.
5. THE SERVICE LATERAL WILL COUPLE DIRECTLY TO A PVC SLIP TEE IN THE MANHOLE TO ALLOW THE DROP PIPE TO CONTACT THE MH WALL FOR ITS ENTIRE LENGTH.
6. THE DROP PIPE, 45° BEND, AND EXTENSION PIPE ARE TO HAVE GLUED JOINTS.
7. THE DROP PIPE EXTENSION MUST CONVEY SEWAGE ALL THE WAY TO THE MAIN CHANNEL.
8. THE DROP PIPE IS TO BE SECURED TO THE MANHOLE WALL BY:
 STAINLESS STEEL STRAPS MEASURING A MINIMUM OF 1-1/2" WIDE BY 1/8" THICK;
 STRAP SPACING WILL BE 3' ON CENTER, WITH A MINIMUM OF 2 STRAPS;
 EACH STRAP WILL BE SECURED TO THE WALL BY A PAIR OF 5/16" STAINLESS STEEL WEDGE ANCHORS.
9. THE ANNULAR SPACE AT THE CORED HOLE IS TO BE GROUTED NEATLY AFTER ASSEMBLY.

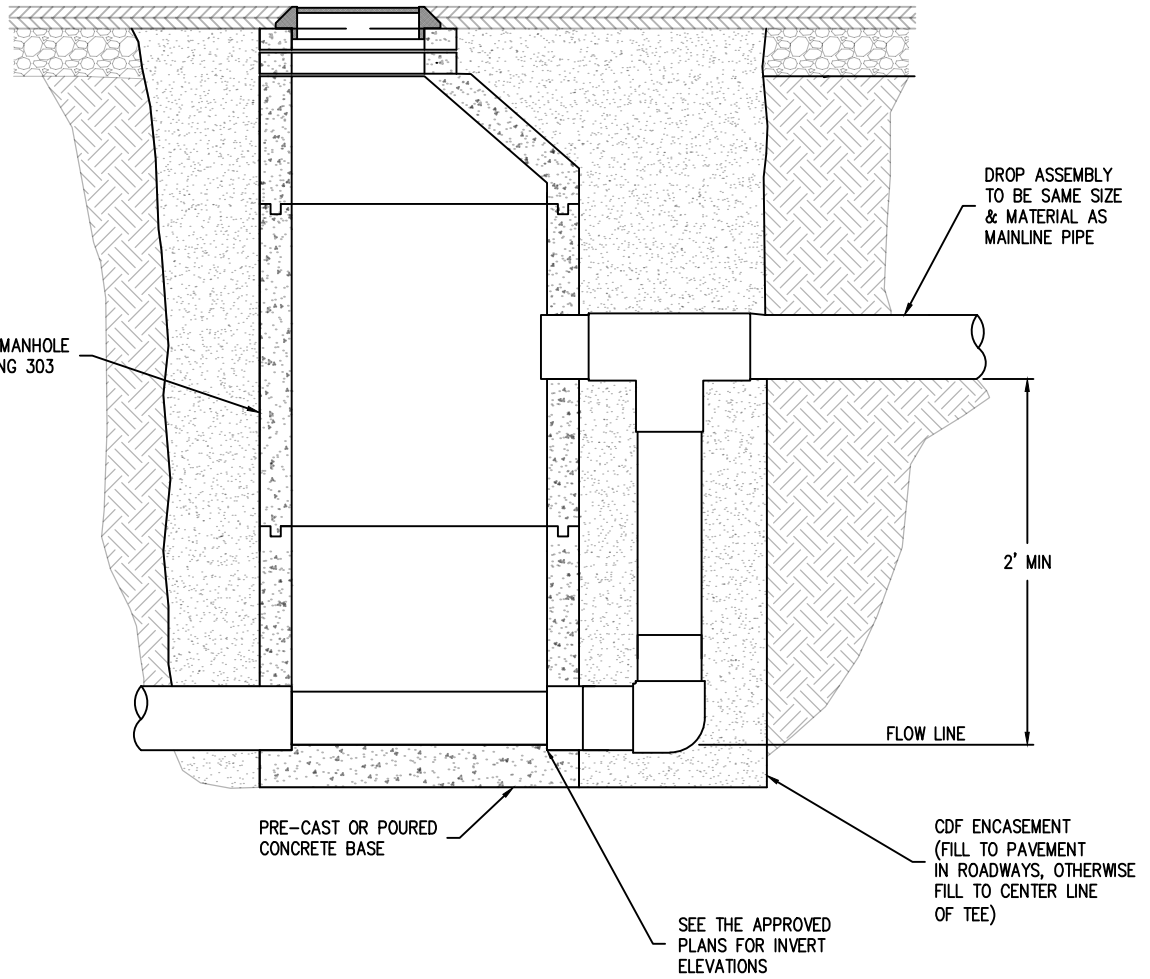


SECTION

NO.	REVISIONS	DATE	BY
1	MISC CALLOUTS	1/9/2019	HSD
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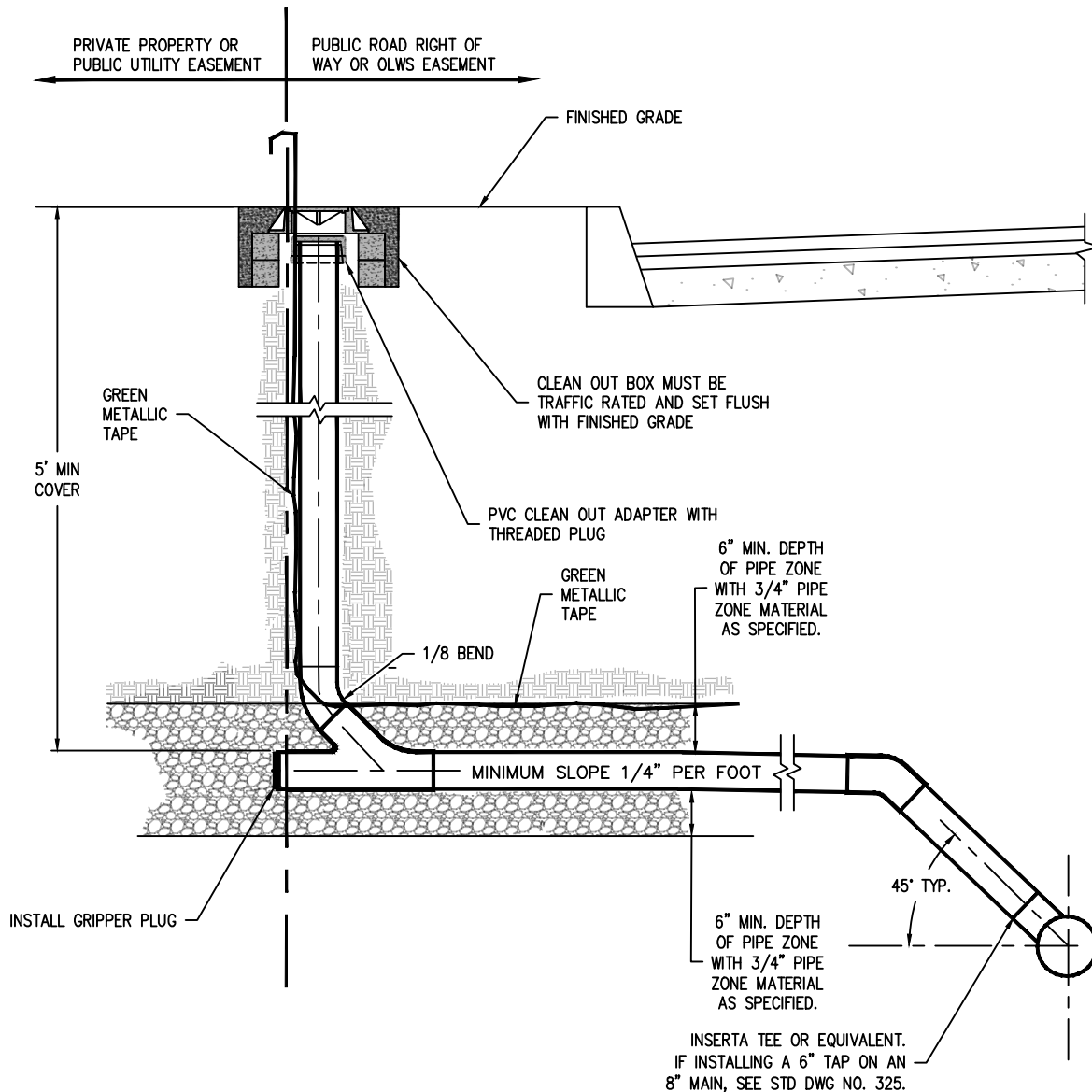


PLAN



SECTION A-A

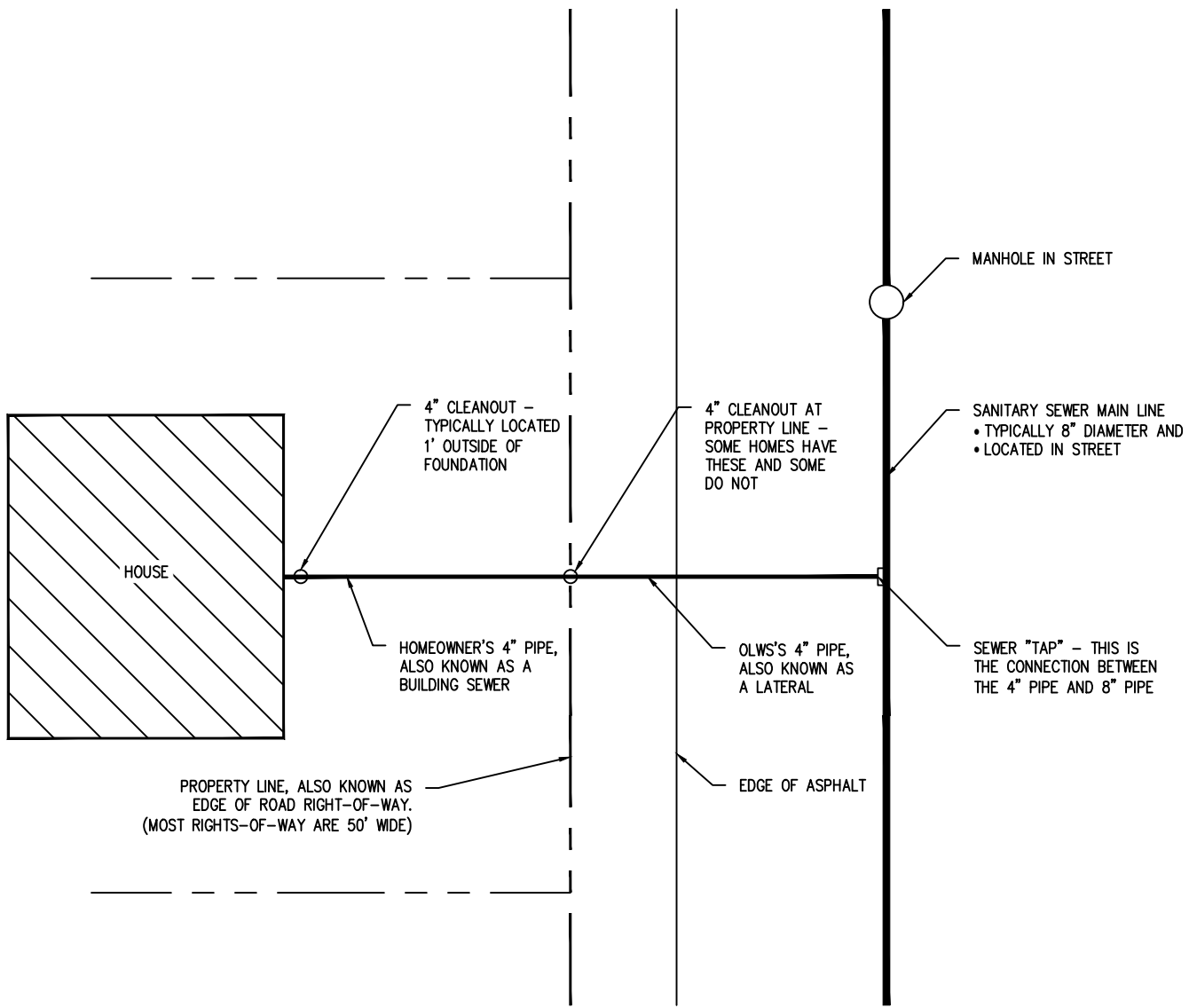
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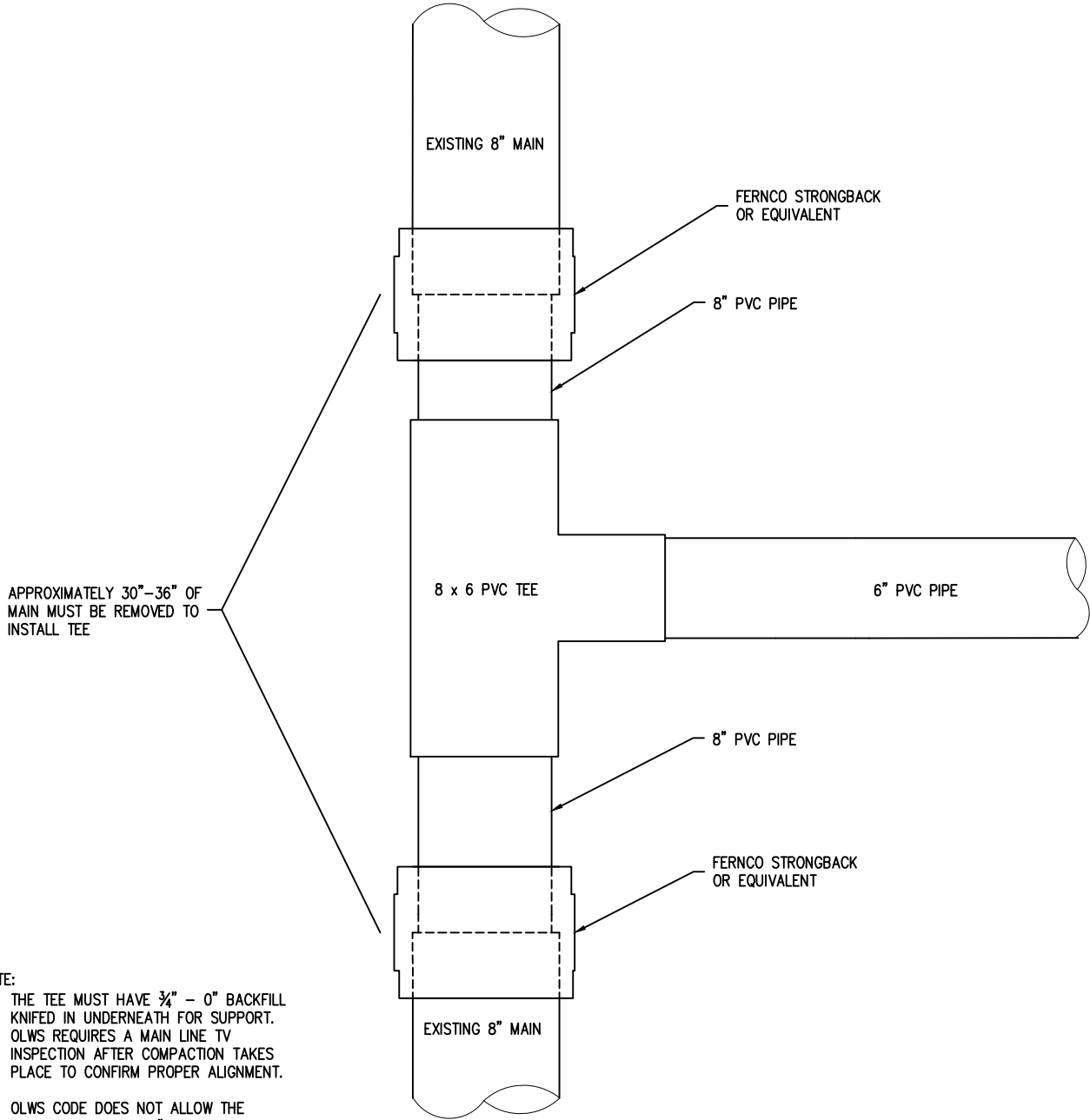
1. 4" LATERALS MUST HAVE 4" CLEAN OUT RISERS, AND 6" LATERALS MUST HAVE 6" CLEAN OUT RISERS.
2. THE CLEAN OUT RISER MUST BE LOCATED WITHIN 6" OF THE PROPERTY LINE AND JUST INSIDE THE ROAD RIGHT OF WAY OR THE OLWS EASEMENT. THE CLEAN OUT RISERS MAY NOT BE LOCATED ON PRIVATE PROPERTY OR IN A PUBLIC UTILITY EASEMENT.
3. THE LATERAL MUST BE INSTALLED WITH A MINIMUM GRADE OF 2% AND MUST RUN PERPENDICULAR FROM THE MAIN TO THE CLEAN OUT.
4. THE CLEAN OUT RISER MUST BE TOPPED WITH A PVC CLEAN OUT ADAPTER WITH A THREADED PLUG.
5. THE CLEAN OUT MUST BE PROTECTED BY A TRAFFIC RATED BOX. EITHER A CAST IRON UNIT OR A COMBINATION CONCRETE AND CAST IRON UNIT IS ACCEPTABLE.
6. OLWS MAY REQUIRE THE TV INSPECTION OF A LATERAL AFTER BACKFILL AND COMPACTION.

NO.	REVISIONS	DATE	BY
1	MISC CALLOUTS, DIMS, AND NOTES	1/9/2019	HSO
2	NOTE CORRECTIONS	3/5/2024	TAP
3			
4			



← PRIVATE PROPERTY | STREET →

NO.	REVISIONS	DATE	BY
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APPROXIMATELY 30"–36" OF MAIN MUST BE REMOVED TO INSTALL TEE

NOTE:

1. THE TEE MUST HAVE $\frac{3}{4}$ " – 0" BACKFILL KNIFED IN UNDERNEATH FOR SUPPORT. OLWS REQUIRES A MAIN LINE TV INSPECTION AFTER COMPACTION TAKES PLACE TO CONFIRM PROPER ALIGNMENT.
2. OLWS CODE DOES NOT ALLOW THE INSTALLATION OF A 6" INSERTA TEE ON AN 8" MAIN LINE AS IT WEAKENS THE STRUCTURAL INTEGRITY OF THE MAIN LINE. INSTEAD, A SECTION OF MAINLINE MUST BE REMOVED AND AN 8"x 6" PVC TEE SPLICED IN TO PROVIDE THE NEW TAP. NOTE THAT THIS OPERATION WILL REQUIRE THE SUBMISSION OF A WRITTEN "PUMP AROUND PLAN" FOR OLWS REVIEW.

NO.	REVISIONS	DATE	BY
1	REMOVED COUPLER JOINT ON TEE	1/9/2019	HSD
2	NOTE CORRECTIONS	3/5/2024	TAP
3			
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WATER SYSTEM STANDARD DRAWING INDEX

400	WATER SYSTEM STANDARD DRAWING INDEX
401	WATER SYSTEM CONSTRUCTION NOTES
402	PIPE TRENCH
407	RESTRAINED JOINTS
408	TAPPING AND CUT-IN METHODS
410	ISOLATION VALVE DETAIL
411	FIRE HYDRANT ASSEMBLY
412	FIRE HYDRANT LOCATIONS
413	BLOWOFF ASSEMBLY
420	ONE INCH WATER SERVICE ASSEMBLY
421	TWO INCH WATER SERVICE ASSEMBLY
422	THREE INCH WATER SERVICES ASSEMBLY
430	WATER METER LOCATION
435	WATER SAMPLING STATION



WATER SYSTEM STANDARD DRAWING

WATER SYSTEM STANDARD DRAWING INDEX

NO.	REVISIONS	DATE	BY
1	MISC DRAWINGS REMOVED OR RENAMED	01/29/2019	HSO
2	INDEX CORRECTIONS, ADDED DRAWING	7/30/2024	TAP
3			
4			

DRAWING NO.

400

DATE: 9/12/2017

SCALE: NTS

NOTES:

1. CONSTRUCTION OF IMPROVEMENTS SHALL BE IN ACCORDANCE WITH OAK LODGE WATER SERVICES (OLWS a.k.a. DISTRICT) DEVELOPER EXTENSION AGREEMENT (as applicable), DISTRICT STANDARD DETAILS AND THE OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, MOST CURRENT EDITION, AS ISSUED BY THE OR. STATE DEPT. OF TRANSPORTATION.
2. A PRE-CONSTRUCTION CONFERENCE IS REQUIRED PRIOR TO CONSTRUCTION AND 48 HOURS ADVANCE NOTIFICATION OF THE LOCAL MUNICIPALITY, OLWS AND ALL AFFECTED UTILITY COMPANIES PRIOR TO THE ACTUAL START OF WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE PROVISIONS OF THE ROAD OPENING PERMIT AS ISSUED BY CLACKAMAS COUNTY.
4. LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY, LOCATE AND PROTECT ALL UTILITIES WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION. SHOW THESE UTILITIES ON THE AS-BUILTS. IF A UTILITY IS DAMAGED, CONTRACTOR SHALL NOTIFY THE AFFECTED UTILITY COMPANY IMMEDIATELY.
5. ALL MAINS, SERVICES, VALVES, FITTINGS, AND OTHER APPURTENANCES MUST BE INSPECTED BY A DISTRICT REPRESENTATIVE BEFORE BURIAL.
6. WATER MAIN TRENCH SECTION AND ALL EXCAVATED AREAS SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH THE STANDARD DETAILS, WITH SECTION 01140.40 OF THE STANDARD SPECIFICATIONS, AND WITH CLACKAMAS COUNTY ROAD OPENING PERMIT. COMPACTION TESTING SHALL BE REQUIRED DURING BACKFILLING OPERATIONS WITHIN ALL ROADWAYS AND AT THE DISCRETION OF THE DISTRICT. IF TRENCH BACKFILL DOES NOT MEET COMPACTION REQUIREMENTS, CONTRACTOR SHALL EXCAVATE, RECOMPACT AND RETEST MATERIAL AT CONTRACTOR'S EXPENSE.
7. RESTORATION OF DAMAGED ROAD SURFACING SHALL BE IN ACCORDANCE WITH CLACKAMAS COUNTY'S REQUIREMENTS. ALL OTHER AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR AS DIRECTED BY THE DISTRICT. THIS INCLUDES SHOULDERS, LANDSCAPING, WALLS, FENCES, DRIVEWAYS, AND OTHER IMPROVEMENTS.
8. THE WATER MAIN SHALL BE INSTALLED WITH A MINIMUM OF 36" OF COVER. INSTALLATION OF MAIN WITH GREATER THAN 48" OF COVER SHALL BE ACCEPTABLE ONLY UNDER THE DIRECTION OF THE DISTRICT.
9. ALL VALVES AND FITTINGS MUST BE MECHANICALLY RESTRAINED BY MEGALUG OR ROMAGRIP JOINT RESTRAINING GLANDS. ALL BELL AND SPIGOT JOINTS MUST BE RESTRAINED BY FIELD LOK GASKETS OR APPROVED EQUAL.
10. A SANITARY GAP MUST BE PROVIDED BETWEEN THE EXISTING AND NEW WATER SYSTEMS. CONNECTION TO THE EXISTING WATER SYSTEM SHALL BE PERFORMED BY THE CONTRACTOR ONLY AFTER COMPLETING OF AN ACCEPTABLE HYDROSTATIC PRESSURE TEST AND THE PIPELINE IS DISINFECTED AND RECEIPT OF APPROVAL OF WATER QUALITY TEST RESULTS FROM THE TESTING LAB.
11. CONTRACTOR SHALL PERFORM PRESSURE TEST AT 180psl OR 1.5 TIMES THE NORMAL WORKING PRESSURE, WHICHEVER IS HIGHER, INCLUDING ON HYDRANTS AND SERVICE LINES. MAINLINE SHALL BE TESTED IN SECTIONS OF NO MORE THAN 1,500 FEET. PRESSURE SHALL BE MAINTAINED FOR 1 HOUR MINIMUM. ANY LEAKAGE IS UNACCEPTABLE.
12. A PIPE PLUG SHALL BE USED ON EACH JOINT DURING INSTALLATION TO PROTECT AGAINST FLOODING OF THE PIPE.
13. NO OTHER UTILITIES SHALL BE INSTALLED WITHIN 36" HORIZONTALLY OF ANY ACTIVE WATER LINE UNLESS OTHERWISE PRE-APPROVED BY THE DISTRICT.
14. CONTRACTOR SHALL POTHOLE A SUFFICIENT DISTANCE AHEAD TO VERIFY DEPTH OF ALL EXISTING WATER MAINS AND CROSSING UTILITIES PRIOR TO CONSTRUCTION AND CONNECTIONS AND TO ANTICIPATE ANY NECESSARY CHANGES IN FITTINGS OR ALIGNMENT.
15. A PROPOSED CONSTRUCTION DRAWING MUST BE SUBMITTED TO THE DISTRICT BEFORE WATER SERVICE WILL BE PROVIDED.
16. DEFLECTION AT PIPE AND FITTING JOINTS WILL BE ALLOWED UP TO 3.0" (11" OVER 18') OR AS RECOMMENDED BY MANUFACTURER, WHICHEVER IS LESS.
17. CONTRACTOR SHALL ONLY DISPOSE OF WASTE MATERIAL AT SITES APPROVED BY CLACKAMAS COUNTY. STOCKPILE MATERIALS ONLY ON DISTRICT APPROVED SITES.
18. **HATCH NOTE:** ALL VAULT HATCHES 2'x2' OR LARGER SHALL BE HINGED, SPRING ASSIST OPENING, INCLUDE RECESSED PADLOCK HASP, DRAINABLE FRAME (C OR U CHANNEL WITH PIPE CONNECTION), H2O RATED MINIMUM, ALUMINUM OR GALVANIZED STEEL. IF HATCH WILL BE LOCATED IN A TRAVELED AREA (ROAD OR DRIVEWAY), SUBMIT MANUFACTURER'S STATEMENT THAT HATCH IS RATED FOR CONTINUOUS AND DELIBERATE H2O TRAFFIC SERVICE. HATCHES SHALL BE CAST INTO VAULT LID OR RISER.
19. ALL PIPE 3" AND LARGER SHALL BE DUCTILE IRON (DI) MINIMUM CLASS 52 (12" AND SMALLER), EXCEPT WHERE TRENCH BACKFILL AND LOADING DICTATE A STRONGER CLASS PIPE OR IN AREAS WHERE PRESSURE EXCEEDS 150 PSI. ALL HYDRANT RUNS AND PIPING INSTALLED WITH MEGA-LUG TYPE JOINT RESTRAINTS SHALL BE DUCTILE IRON PIPE CLASS 52, NO EXCEPTIONS. PIPING INSTALLED WITHIN VAULTS OR OTHER EXPOSED AREAS SHALL BE DUCTILE IRON CLASS 53.
20. CASINGS SHALL BE NEW STEEL, HDPE OR PVC; MATERIAL AND WALL THICKNESS AT THE DISCRETION OF THE DISTRICT. PIPE THROUGH CASINGS SHALL BE SUPPORTED WITH RUNNERS SPACED NO FARTHER THAN 8 FEET APART. RUNNERS SHALL BE MANUFACTURED PRODUCTS (PSI, CALPICO, OR APPROVED EQUAL), NO BLOCKS AND STRAPS. CASING ENDS SHALL BE CAPPED WITH MANUFACTURED CASING END SEALS.
21. WATER MAINS AND SERVICES MUST BE INSTALLED A MINIMUM CLEAR DISTANCE OF 5 FEET HORIZONTALLY FROM SANITARY SEWERS.
22. CONTRACTORS WORKING WITHIN THE RIGHT OF WAY OR ON EXISTING DISTRICT INFRASTRUCTURE SHALL BE LICENSED, BONDED AND HAVE EXPERIENCE INSTALLING PUBLIC DOMESTIC WATER SYSTEMS AND BE PREPARED TO PRESENT EXAMPLES OF 5 SUCH PROJECTS UPON REQUEST BY THE DISTRICT.

WATER SYSTEM CONSTRUCTION NOTES

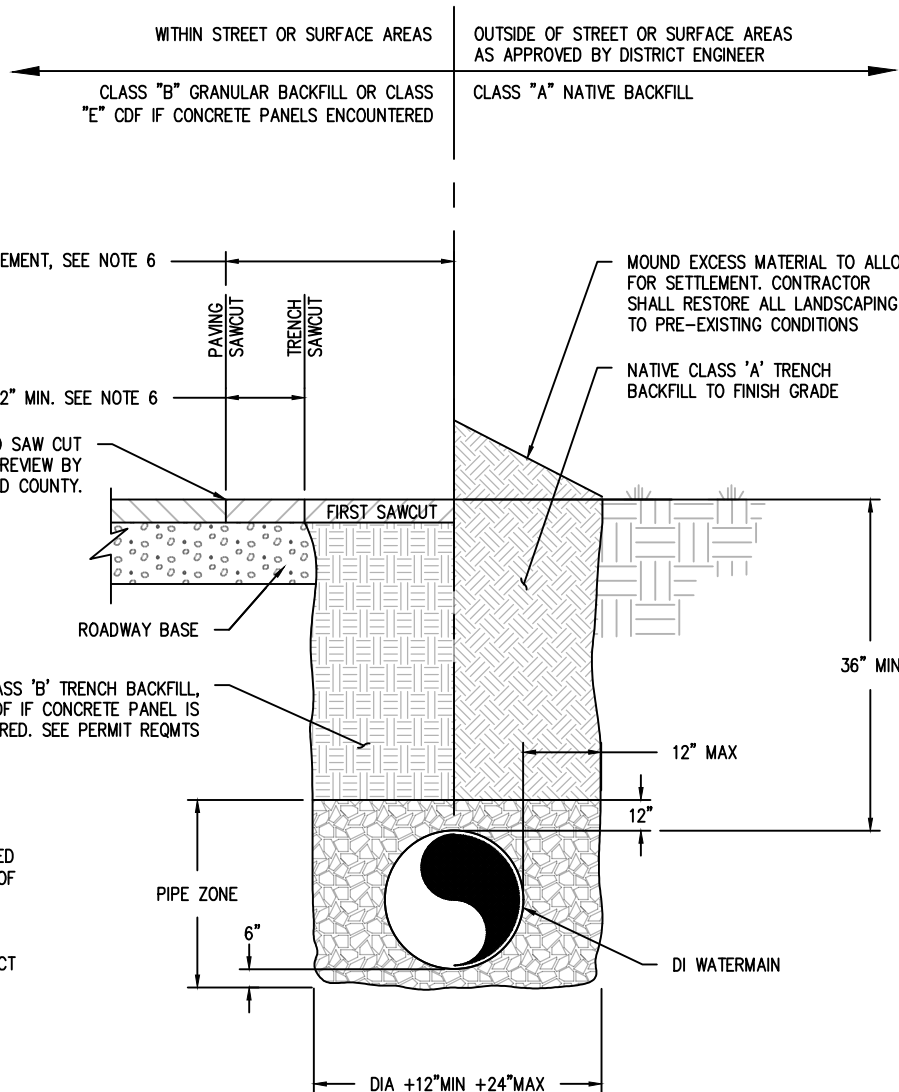
NO.	REVISIONS	DATE	BY
1	MISC NOTES	02/18/2020	HSO
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DRAWING NO.

401

DATE: 9/12/2017

SCALE: NTS



NOTES:

1. PIPE ZONE MATERIAL SHALL BE 3/4"-0" CRUSHED ROCK GRANULAR BACKFILL COMPACTED TO 95% OF AASHTO T-99.
2. CLASS "A" NATIVE BACKFILL MAY ONLY BE USED OUTSIDE OF PAVED AREAS AND REQUIRES DISTRICT APPROVAL. BACKFILL SHALL BE COMPACTED TO 90% OF AASHTO T-99 IN LIFTS NOT EXCEEDING 18" (LOOSE MEASURE).
3. CLASS "B" 3/4"-0" CRUSHED ROCK GRANULAR BACKFILL SHALL BE USED WITHIN PAVED AREAS. BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-99.
4. BACKFILL SHALL BE PLACED AND COMPACTED IN A MAXIMUM OF 24-INCH LIFTS. COMPACTION TESTING REQUIRED PER COUNTY SPECIFICATIONS.
5. COMPLETE SURFACE AND PAVEMENT RESTORATION IN ACCORDANCE WITH THE PROVISIONS OF THE ROAD OPENING PERMIT FROM CLACKAMAS COUNTY.
6. SAWCUT WIDTH AND AC PAVEMENT REPLACEMENT SHALL BE PER APPLICABLE JURISDICTIONAL REQUIREMENTS. SAWCUT CLEAN EDGE FOR AC PAVEMENT REPLACEMENT. SAND SEAL JOINT.
7. PROVIDE CLASS "E" CDF BACKFILL FOR ALL TRENCH CROSSINGS LOCATED IN VEHICLE TRAVEL LANES OF ARTERIAL & COLLECTOR STREETS, OR WHERE CONCRETE PANELS ARE ENCOUNTERED. IF THESE SPECIFICATIONS CONFLICT WITH THE SPECIFICATIONS OF ANOTHER APPLICABLE JURISDICTION, THE MORE STRINGENT SPECIFICATION SHALL GOVERN.

TYPICAL PIPE TRENCH DETAIL

NO.	REVISIONS	DATE	BY
1			
2			
3			
4			

DRAWING NO.

402

DATE: 02/18/2020

SCALE: NTS

RESTRAINED JOINT PIPE IS APPROPRIATE TO USE IN MANY SITUATIONS. HOWEVER, OLWS WILL BE THE SOLE DETERMINER IF THE APPLICATION IS APPROPRIATE ON A GIVEN JOB. TYPICAL APPLICATIONS INCLUDE:

1. DEAD END MAINS THAT MAY BE EXTENDED.
2. SOILS NOT SUPPORTIVE OF THRUST BLOCKING.
3. INSUFFICIENT BEARING SOIL BEHIND FITTINGS.
4. VERTICAL BENDS (not covered here. must be designed by engineer for each job)

THE FOLLOWING PRODUCTS ARE PRE-APPROVED FOR USE IN RESTRAINED JOINT APPLICATIONS. ALL RESTRAINED JOINT PIPE SHALL BE DUCTILE IRON, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT.

1. GRIFFIN: SNAP-LOK or BOLT-LOK
2. US PIPE: TR-FLEX or FIELD-LOK GASKET
3. PACIFIC STATES: THRUST-LOCK
4. EBAA IRON: MEGALUG
5. ROMAC: ROMAGRIP

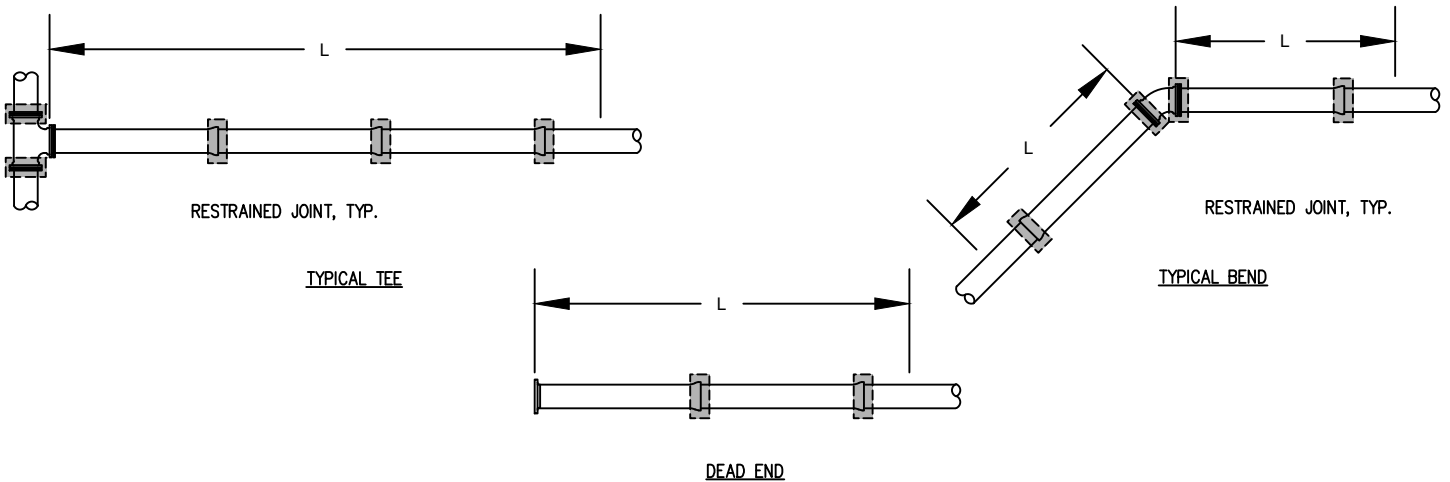
THE FOLLOWING TABLE HAS BEEN DEVELOPED USING THE DUCTILE IRON PIPE RESEARCH ASSOCIATION RESTRAINED JOINT CALCULATOR. THE FOLLOWING CONDITIONS MUST BE MET FOR THESE RESULTS TO BE VALID. IF ANY OF THESE CONDITIONS CANNOT BE MET, PROJECT SPECIFIC CALCULATIONS MUST BE PROVIDED:

- A) THIS TABLE ONLY FOR BARE DUCTILE IRON PIPE. ANY OTHER TYPES OF PIPE WILL REQUIRE RE-EVALUATION.
- B) PIPE LAYING CONDITION TYPE 4 or 5. SELECT GRANULAR BEDDING MATERIAL BELOW PIPE. PIPE ZONE MATERIAL EXTENDING TO TOP OF PIPE MECHANICALLY COMPACTED. PIPE RESTING DIRECTLY ON NATIVE TRENCH BOTTOM IS NOT ACCEPTABLE.
- C) BEDDING SAND IS WELL GRADED WITH FINES. IF GRAVELLY SAND IS USED, LENGTHS MUST BE MULTIPLIED BY 1.3
- D) DEPTH OF COVER IS 3 FEET MINIMUM.
- E) 300psi TEST PRESSURE MAXIMUM. FOR HIGHER TEST PRESSURE, TABLE LENGTHS MUST BE MULTIPLIED BY THE PROPORTIONAL DIFFERENCE. EXAMPLE: FOR 350psi, $350/300=1.17$ THEREFORE, LENGTHS MUST BE MULTIPLIED BY 1.17

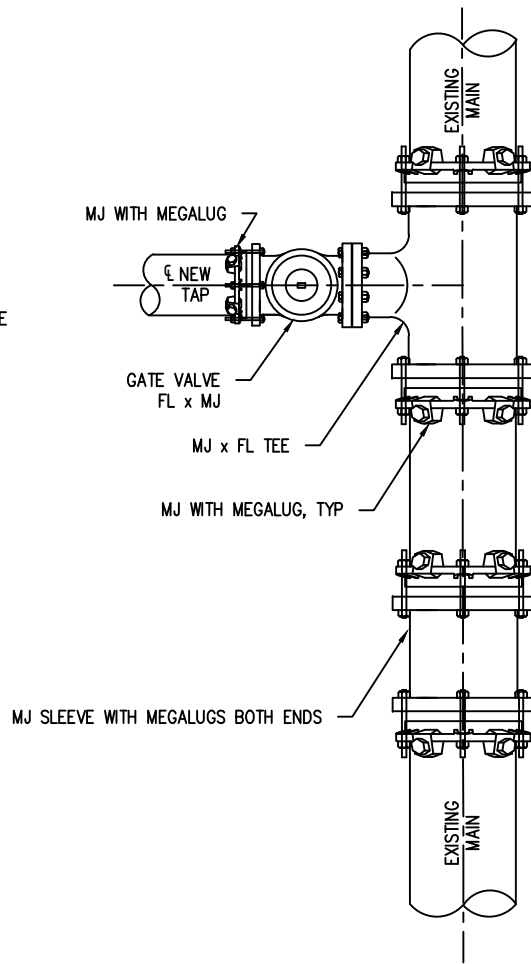
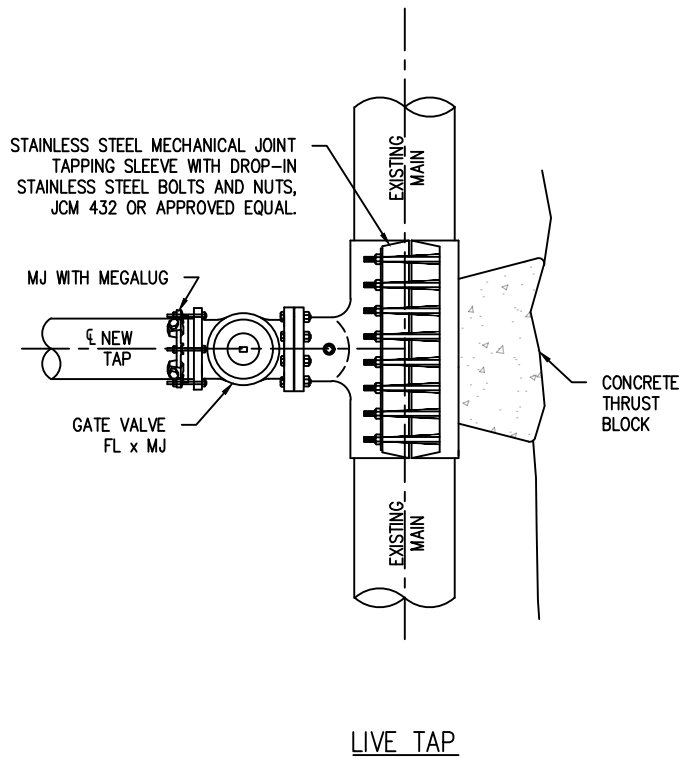
THE LENGTH "L" GIVEN BELOW INDICATES THE DISTANCE THAT PIPE MUST BE RESTRAINED PAST THE FITTING JOINT. ALL JOINTS WITHIN THIS DISTANCE MUST BE RESTRAINED, INCLUDING THE FITTING.

PIPE DIAMETER	RESTRAINED LENGTH, "L"						
	11¼' BEND	22½' BEND	45' BEND	90' BEND	TEE w/SAME SIZE BRANCH*	DEAD END	REDUCER **
4"	3'	5'	11'	25'	26'	50'	30'
6"	4'	7'	14'	36'	48'	72'	37'
8"	5'	10'	19'	46'	70'	94'	67'
10"	6'	11'	24'	56'	90'	114'	70'
12"	7'	13'	28'	66'	110'	134'	71'
16"	10'	17'	35'	85'	151'	175'	104'
18"	11'	19'	40'	95'	170'	196'	106'

* assumes all three legs restrained, and a minimum 5' stick of pipe in each run leg.
 ** assumes reducer down 2 sizes. (example 12"x8"). Larger reductions shall be treated as a tee.



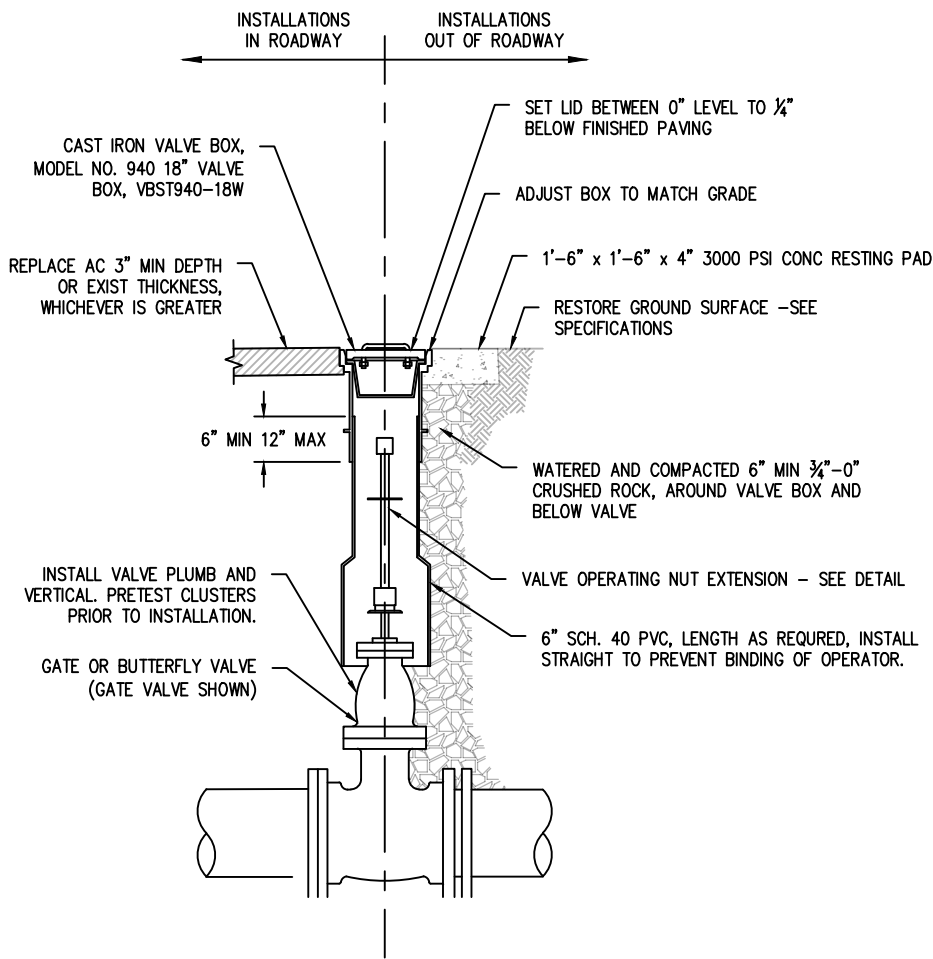
NO.	REVISIONS	DATE	BY
1	UPDATED NOTES	3/11/2024	TAP
2			
3			
4			



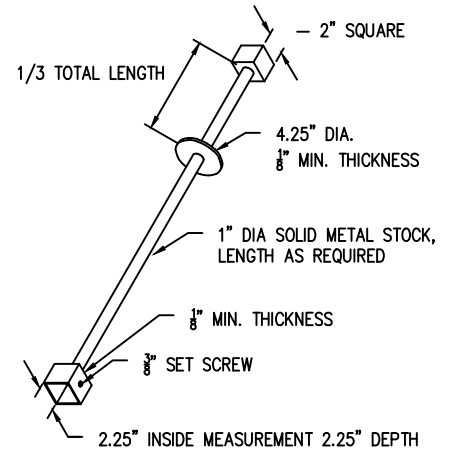
NOTES:

1. TAPPING SLEEVE SHALL BE STAINLESS STEEL MECHANICAL SLEEVE.
2. CONNECTIONS TO EXISTING MAIN SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF OLWS AND WILL NOT BE ALLOWED ON FRIDAYS, HOLIDAYS OR WEEKENDS. VALVES SHALL BE OPERATED BY OLWS ONLY.
3. 11 MIL PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THRUST BLOCK IS POURED.
4. SUPPORT VALVE AND SLEEVE CONTINUOUSLY THROUGH INSTALLATION.
5. TEST TAPPING SLEEVE PRIOR TO CUTTING EXISTING MAIN.

NO.	REVISIONS	DATE	BY
1	BACKFILL REMOVED. SLEEVE MATERIAL TO SST	1/2/2020	HSD
2			
3			
4			



ISOLATION VALVE DETAIL



OPERATING NUT EXTENSION

ISOLATION VALVE NOTES:

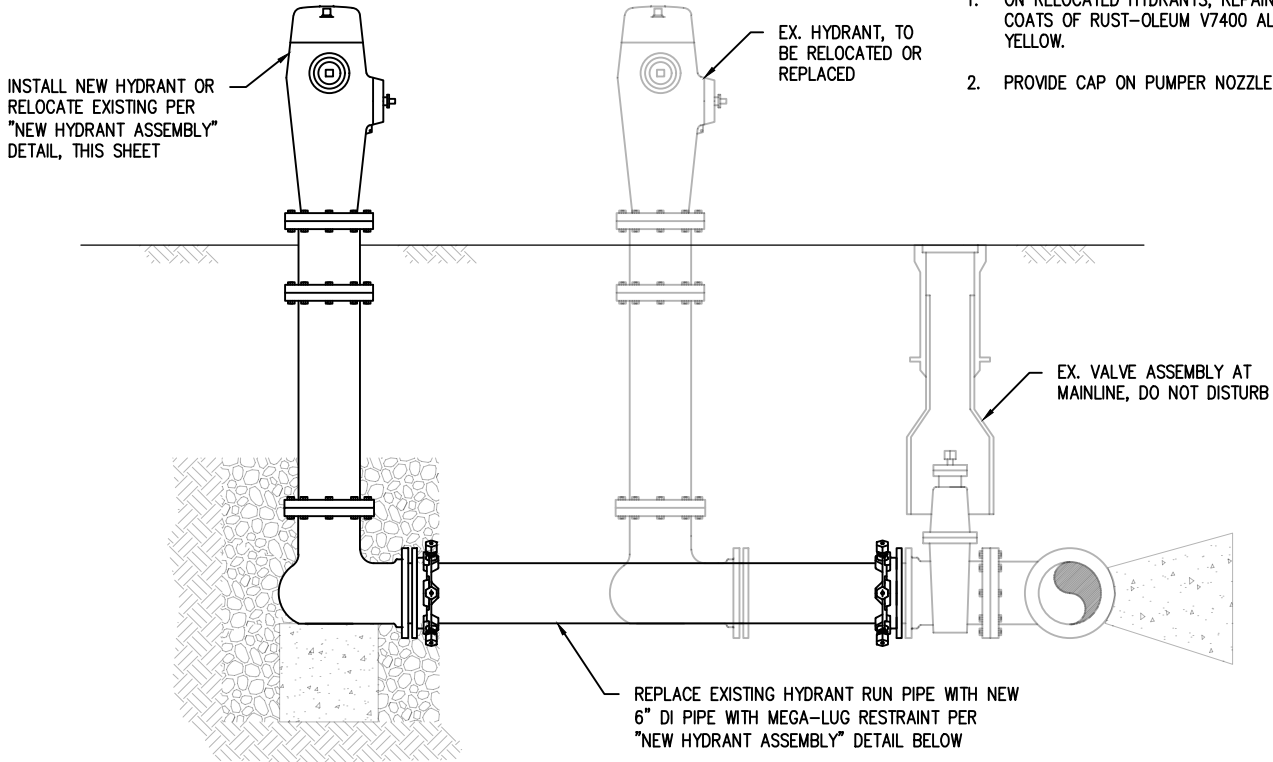
1. VALVES SHALL BE INSTALLED AT NO MORE THAN 500 FT SPACING REGARDLESS OF MAIN SIZE.
2. ISOLATION VALVES 2" AND LARGER ARE TO BE NRS RESILIENT SEATED GATE VALVES MEETING AWWA C509 OR C515. VALVES 14" AND LARGER SHALL BE BUTTERFLY VALVES MEETING AWWA C504.
3. BACKFILL AROUND VALVE BOXES SHALL BE COMPACTED USING A JUMPING JACK.
4. STAR PIPE PRODUCTS MODEL NUMBERS SHOWN. OWNER APPROVED EQUALS WILL BE ALLOWED.
5. ALL VALVES SHALL BE SUPPLIED WITH VALVE BOX AND LID. LID SHALL HAVE RECESSED HANDLE.
6. ALL VALVES THAT WILL BE PART OF A CUT-IN CONNECTION OR HOT TAP ON AN EXISTING MAIN SHALL BE PRE-PRESSURE TESTED ON BOTH SIDES OF THE SEAT PRIOR TO INSTALLATION.

OPERATING NUT EXTENSION NOTES:

1. EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS 5 FEET OR DEEPER BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG, ONLY ONE EXTENSION PER VALVE. ALL EXTENSIONS ARE TO BE SIZED AS NOTED AND MADE OF STEEL TO ASTM A36 A40 A120.
2. FOR EXTENSIONS LONGER THAN 4 FEET AND/OR VALVES LARGER THAN 12" DIAMETER, BAR SHALL BE 1 1/4" DIAMETER.

NO.	REVISIONS	DATE	BY
1	SPACING AND DEPTH REQ'D	02/18/2020	HSO
2	SPACING AND DEPTH REQ'D	12/14/2020	HSO
3	REVISED MANUFACTURER, EXTENSION REQ'D	7/25/2024	TAP
4			

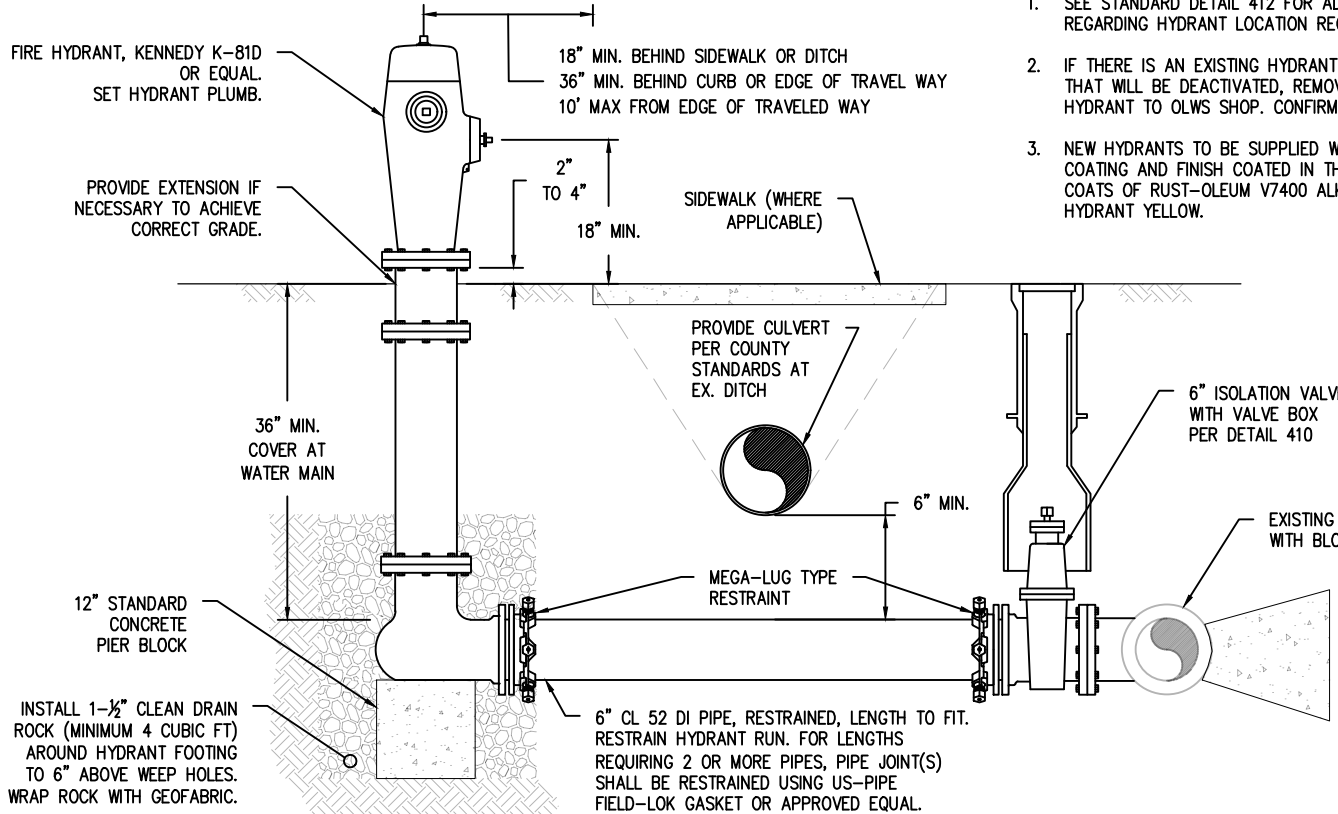
HYDRANT RELOCATION



RELOCATED HYDRANT NOTES:

1. ON RELOCATED HYDRANTS, REPAINT HYDRANTS WITH TWO COATS OF RUST-OLEUM V7400 ALKYD ENAMEL, FIRE HYDRANT YELLOW.
2. PROVIDE CAP ON PUMPER NOZZLE PER OLWS STANDARDS.

NEW HYDRANT ASSEMBLY



NEW HYDRANT NOTES:

1. SEE STANDARD DETAIL 412 FOR ADDITIONAL DETAILS REGARDING HYDRANT LOCATION REQUIREMENTS.
2. IF THERE IS AN EXISTING HYDRANT IN THE VICINITY THAT WILL BE DEACTIVATED, REMOVE AND DELIVER HYDRANT TO OLWS SHOP. CONFIRM WITH OLWS.
3. NEW HYDRANTS TO BE SUPPLIED WITH FACTORY COATING AND FINISH COATED IN THE FIELD WITH TWO COATS OF RUST-OLEUM V7400 ALKYD ENAMEL, FIRE HYDRANT YELLOW.

OAK LODGE
WATER SERVICES

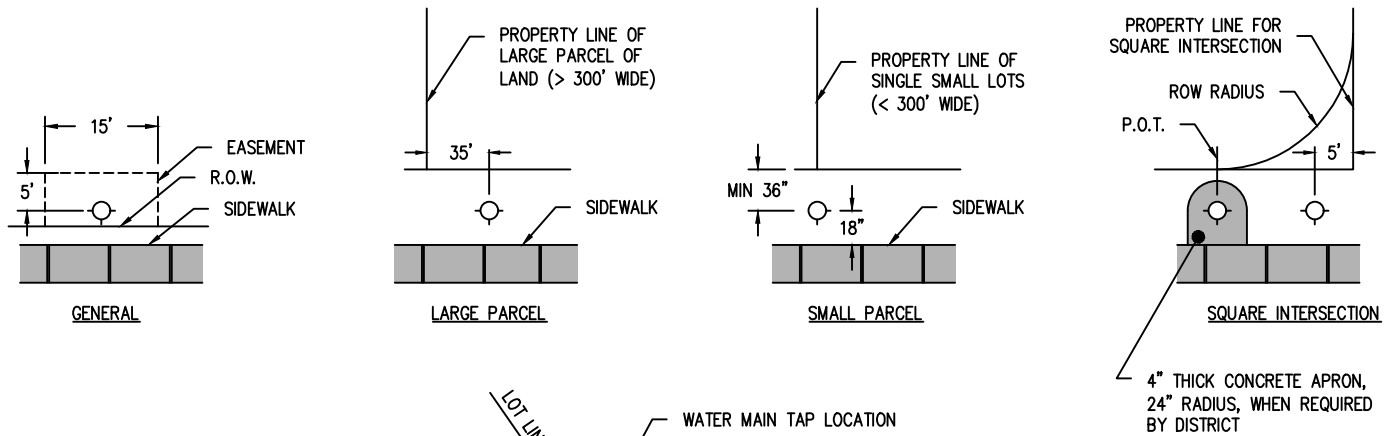
WATER SYSTEM STANDARD DRAWING

FIRE HYDRANT ASSEMBLY

NO.	REVISIONS	DATE	BY
1	MINOR DRAIN ROCK AND BLOCK CHANGES	1/2/2020	HSD
2	CHANGE TO FH MANUFACTURER	7/24/2024	TAP
3			
4			

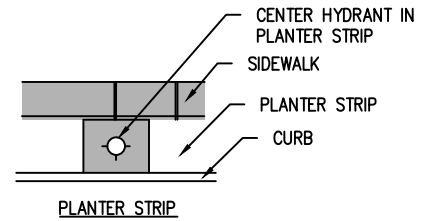
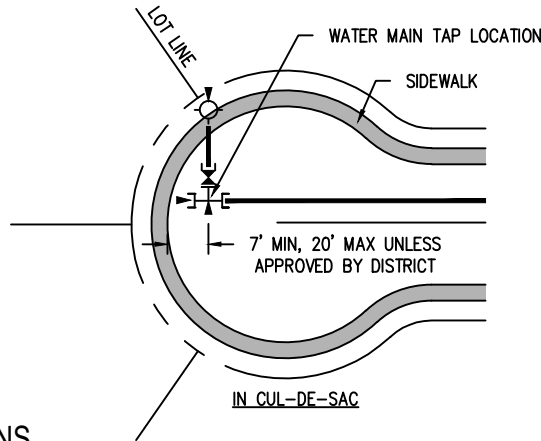
DRAWING NO.
411

DATE: 9/12/2017
SCALE: NTS

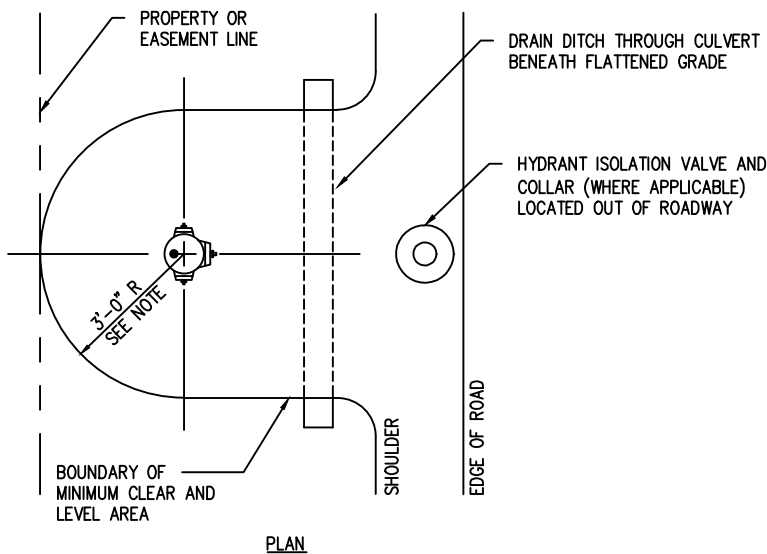


HYDRANT LOCATIONS NOTES:

1. COORDINATE HYDRANT LOCATION WITH DISTRICT.
2. HYDRANTS SHALL BE INSTALLED AT THE END OF ALL 8" DIAMETER AND LARGER DEAD END MAINS.
3. IF HYDRANT CANNOT BE LOCATED WITHIN ROW WITH 3' CLEAR, AN EASEMENT MUST BE PROVIDED.

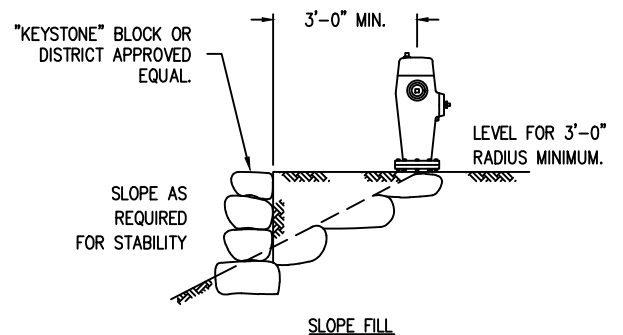
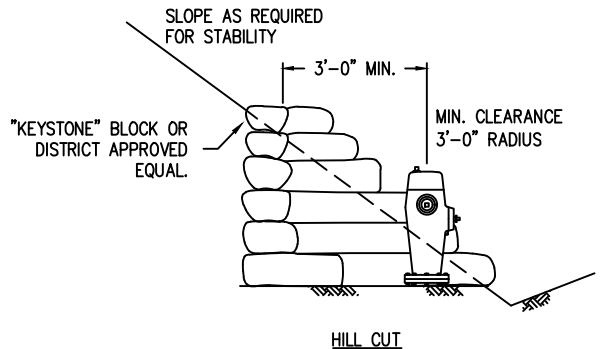


TYPICAL HYDRANT LOCATIONS



NOTES:

1. SURFACE TO 4" THICK CONCRETE PAD, FREE FROM OBSTRUCTIONS, LEVEL, AND UNIFORMLY GRADED AROUND HYDRANT, MIN OF 3 FEET IN ALL DIRECTIONS.
2. ROCKERY OR KEYSTONE TYPE RETAINING WALL TO BE PROVIDED WHERE NECESSARY IN CUT AND FILL AREAS.

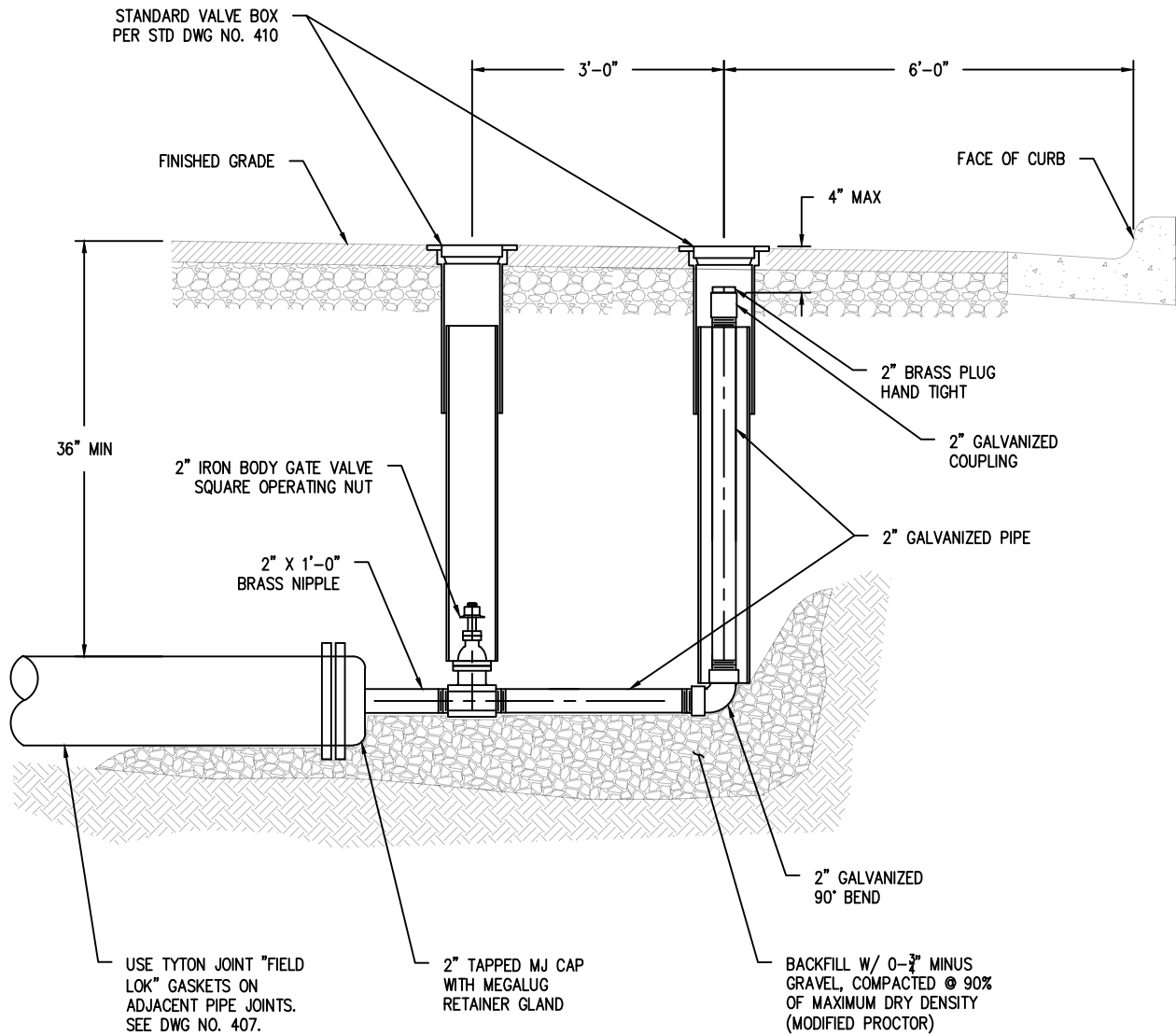


CLEARANCE AND GRADING REQUIREMENTS FOR HYDRANTS

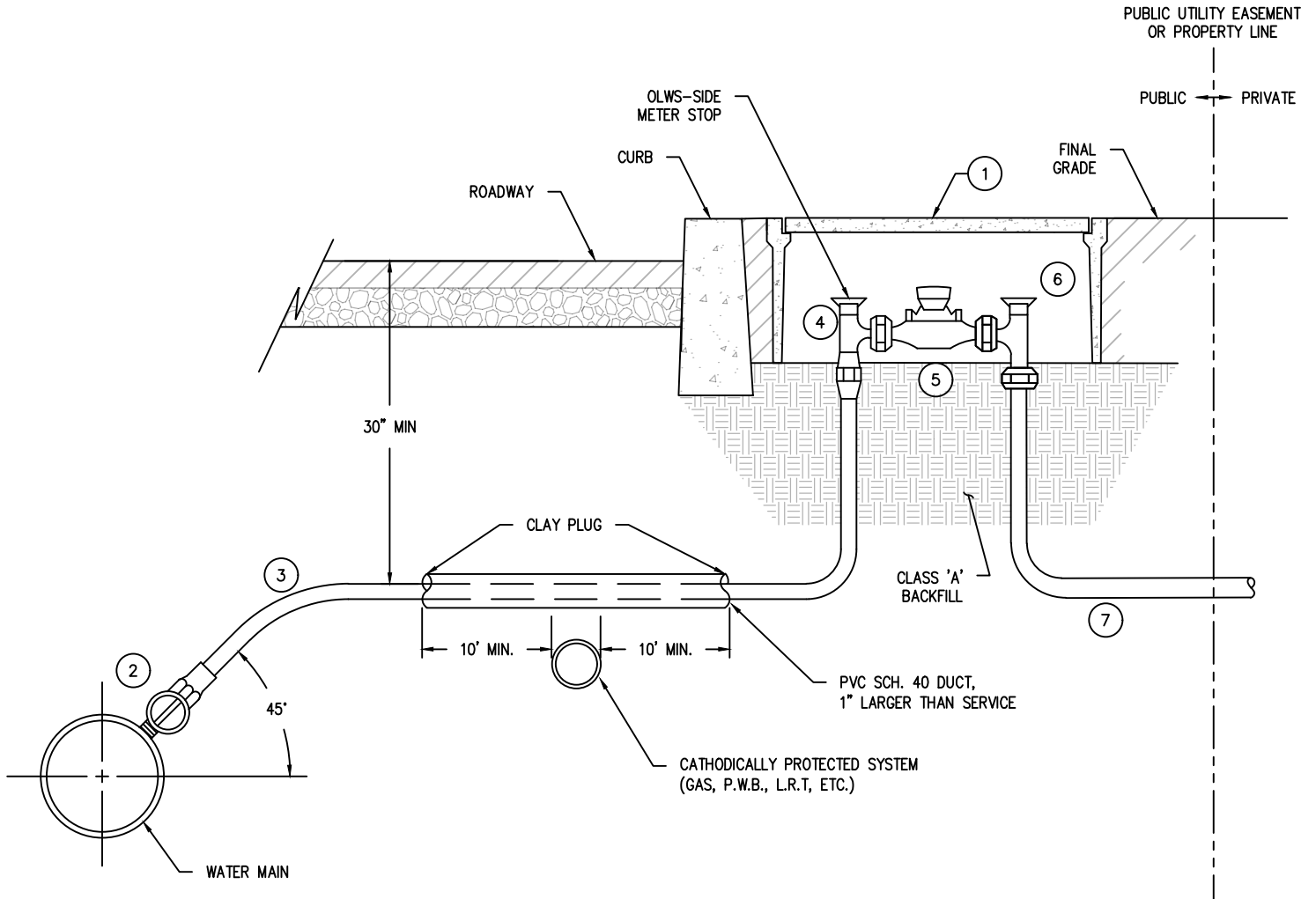
OAK LODGE
WATER SERVICES
WATER SYSTEM STANDARD DRAWING

FIRE HYDRANT LOCATIONS			
NO.	REVISIONS	DATE	BY
1	REARRANGED AND ADDED HEADINGS	02/18/2020	HSC
2			
3			
4			

DRAWING NO.
412
 DATE: 07/07/2017
 SCALE: NTS



NO.	REVISIONS	DATE	BY
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2			
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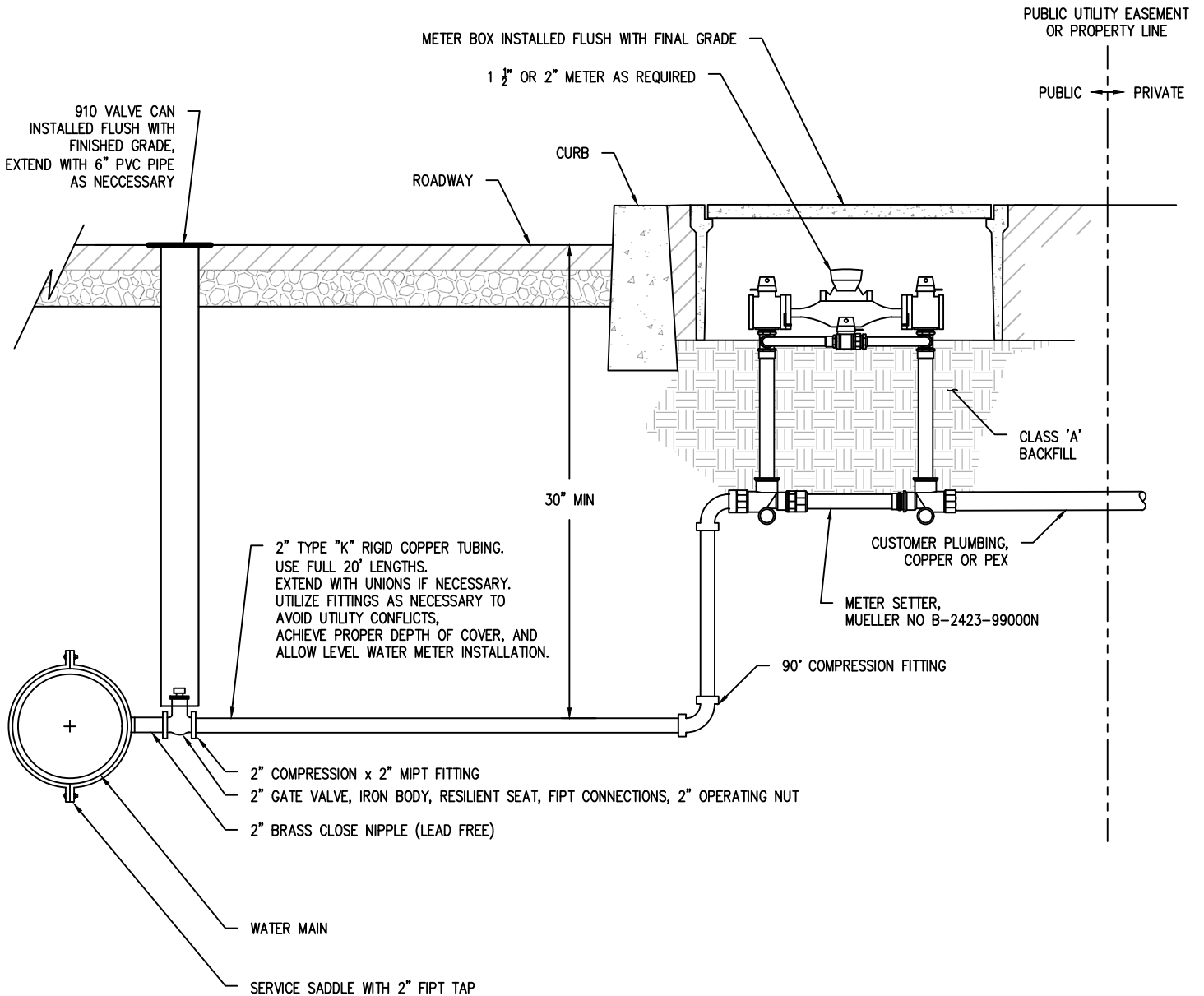
NOTES:

1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE PRE-APPROVED BY OLWS.
2. WATER MAIN TRENCH MUST BE 3-FOOT WIDE X 6-FOOT DEEP MINIMUM, WITH 1-FOOT CLEAR BEHIND THE MAIN AND 1-FOOT CLEAR UNDER THE MAIN.
3. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4" MINUS CRUSHED AGGREGATE AND COMPACTED TO 95% MAX. DENS. AS DETERMINED BY AASHTO T-180. COPPER SERVICE SHALL BE BEDDED AND COVERED WITH BACKFILL 6" ALL AROUND SERVICE. IN ROADS, BACKFILL SHALL BE EXTENDED TO TOP OF EXCAVATION.
4. WHEN AN ACTIVE CATHODIC PROTECTED SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED AS SHOWN ABOVE WITH CLAY PLUG.
5. THE COMPLETE WATER SERVICE MUST BE INSPECTED OLWS PRIOR TO BACKFILL OR BE RE-EXCAVATED WITHOUT COST TO OLWS.
6. FOR LOCATION OF OLWS-SIDE METER STOP RELATIVE TO PROPERTY LINE, EASEMENT LINE, CURB, OR SIDEWALK, SEE DRAWING 430.

KEYNOTES:

1. OLWS STANDARD METER BOX WITH TOP OF LID AT FINAL GRADE.
2. CORPORATION STOP VALVE. FULL-PORT BALL TYPE UNIT TAPPED DIRECTLY INTO WATER MAIN WITH MALE IRON PIPE THREADS. OPERATING NUT INSTALLED IN 3 O'CLOCK OR 9 O'CLOCK POSITION.
3. 3/4" OR 1" SOFT TEMPER, TYPE 'K' COPPER TUBING COMPLYING WITH ASTM B-88. ENTIRE SERVICE SHALL BE SINGLE PIECE OF NEW PIPE FROM CORP STOP TO OLWS-SIDE METER STOP. COPPER-TO-COPPER UNIONS ARE ONLY ACCEPTABLE WHEN WATER SERVICE IS LONGER THAN 100 FEET AND ONLY WITH PRIOR APPROVAL OF DISTRICT ENGINEER.
4. OLWS-SIDE METER STOP INSTALLED 7" TO 9" BELOW FINISH GRADE. FULL-PORT BALL TYPE ANGLED METER STOP WITH LOCKING WINGS.
5. WATER METER, TO BE SUPPLIED AND INSTALLED BY OLWS.
6. CUSTOMER-SIDE METER STOP SAME AS OLWS-SIDE, EXCEPT BOTH BALL-TYPE AND KEY-TYPE ARE ACCEPTABLE AND LOCKING WINGS ARE NOT REQUIRED.
7. CUSTOMER-SIDE PLUMBING WITHIN THE METER BOX SHALL BE PEX OR COPPER. PVC IS NOT ACCEPTABLE.

NO.	REVISIONS	DATE	BY
1	SPECS	02/18/2020	HSO
2	TRENCH DIMENSIONS AND UNION ALLOWANCE	12/14/2020	HSO
3	NOTE CORRECTIONS	3/5/2024	TAP
4			



1 1/2" AND 2" WATER SERVICE ASSEMBLY

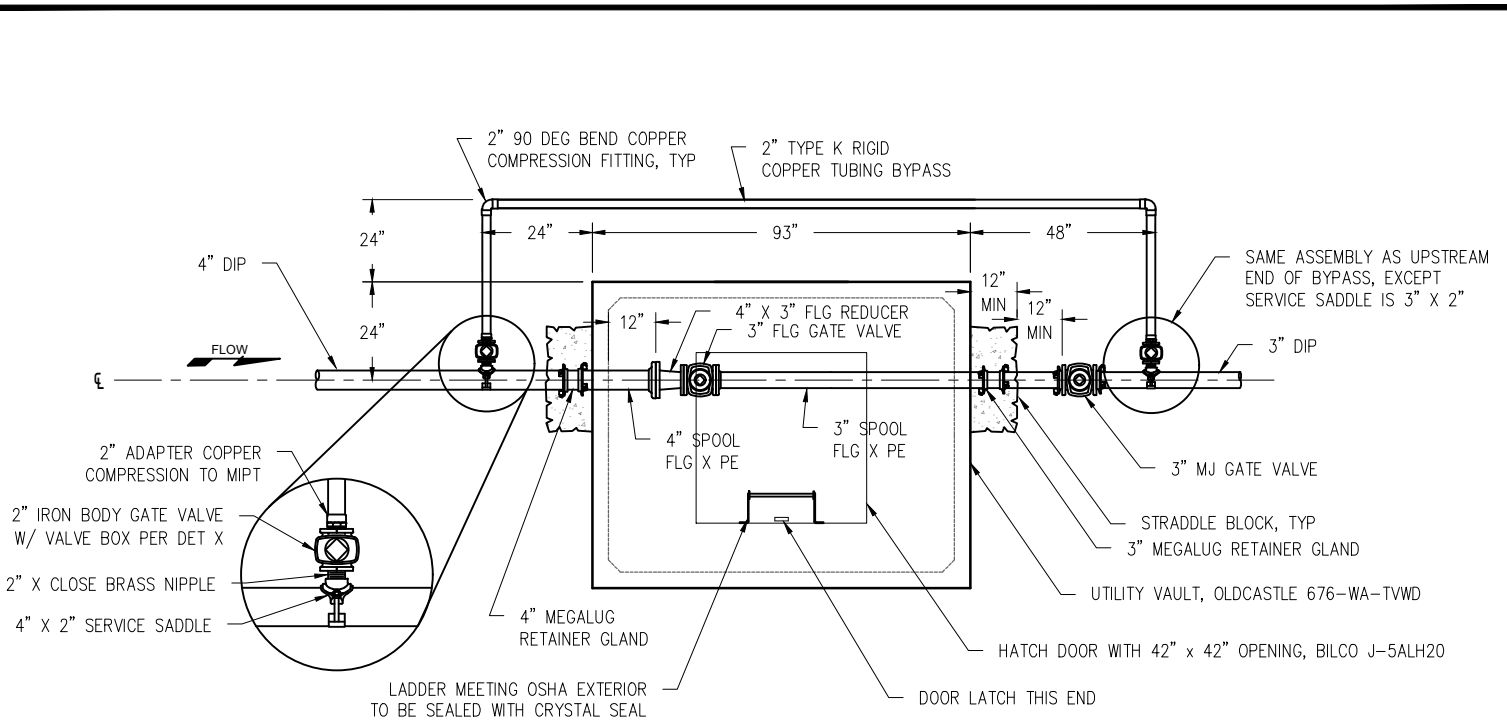
NO.	REVISIONS	DATE	BY
1	CLARIFICATION AND TYPOS	12/14/2020	HCO
2	ADDED METER SETTER	7/30/2024	TAP
3			
4			

DRAWING NO.

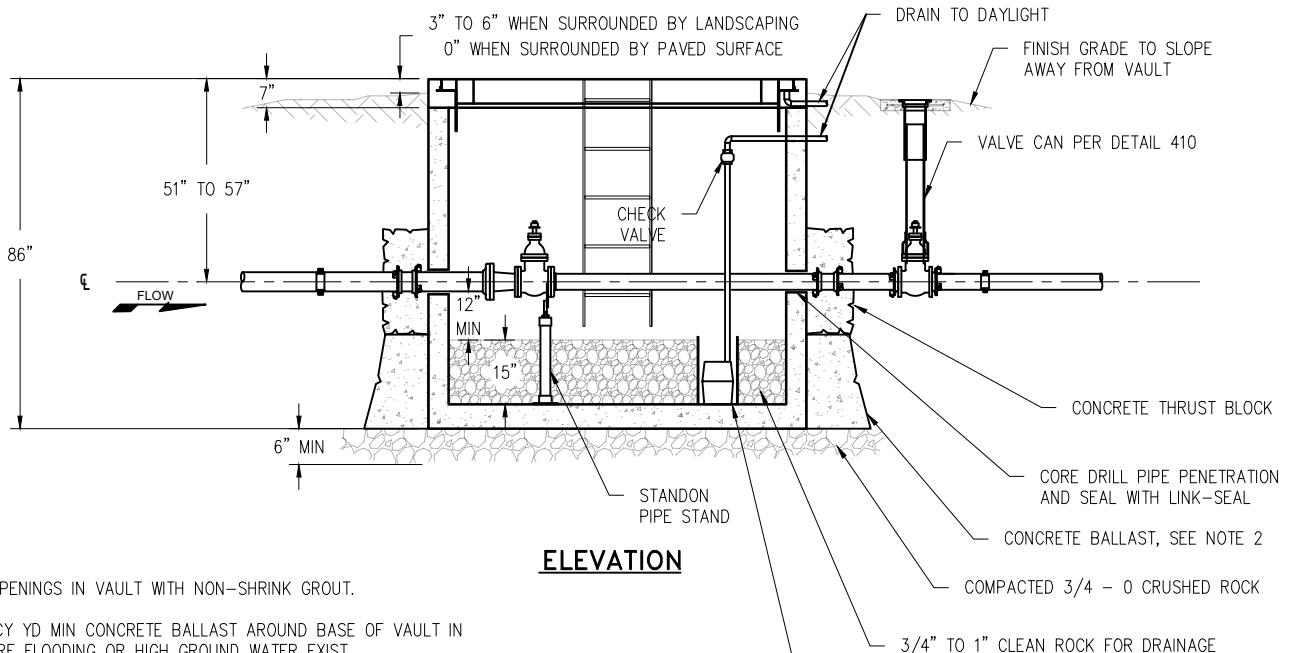
421

DATE: 02/18/2020

SCALE: NTS



PLAN



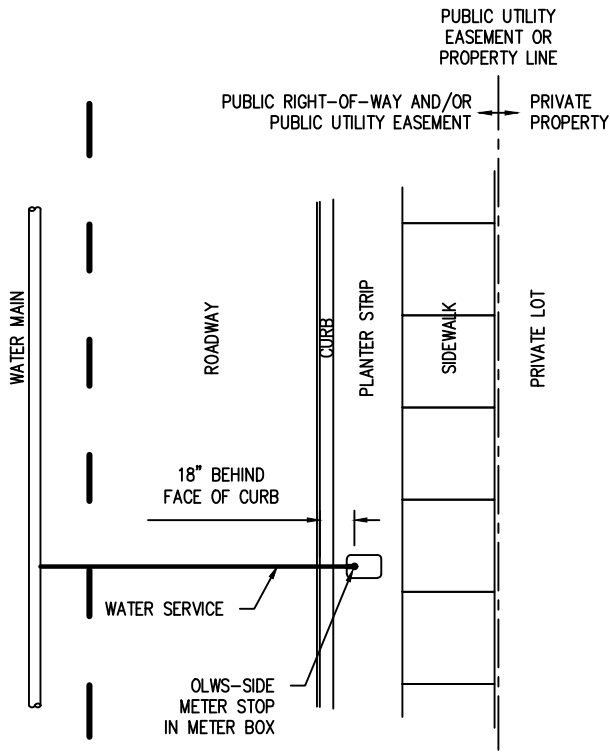
ELEVATION

NOTES:

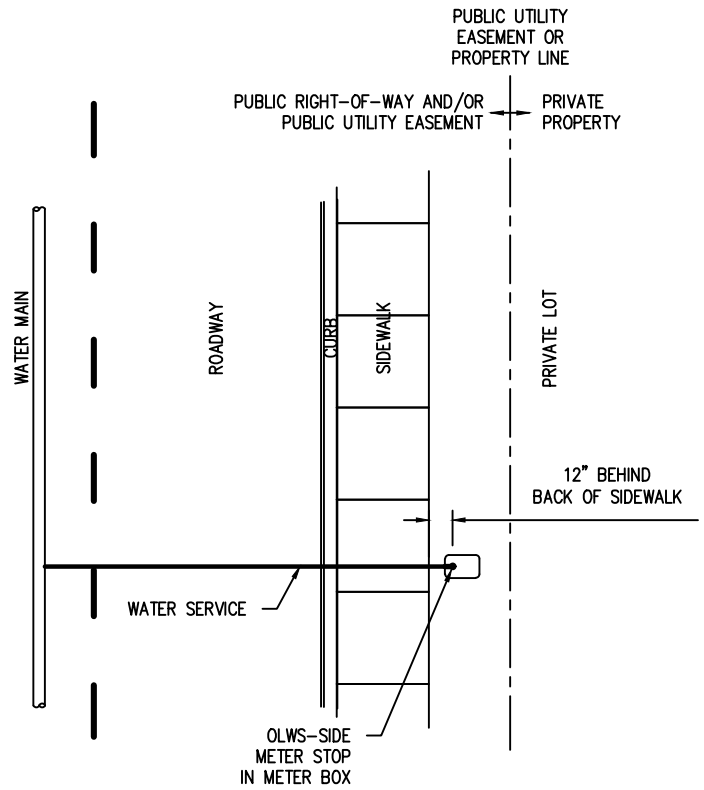
1. SEAL ALL OPENINGS IN VAULT WITH NON-SHRINK GROUT.
2. INSTALL 3 CY YD MIN CONCRETE BALLAST AROUND BASE OF VAULT IN AREAS WHERE FLOODING OR HIGH GROUND WATER EXIST.
3. ALL MATERIALS SHALL BE AS NAMED OR EQUAL. SUBMIT ALTERNATES FOR APPROVAL.
4. ORS 92.044(7) PROHIBITS LOCATING ANY UTILITY INFRASTRUCTURE WITHIN 12 INCHES OF A SURVEY MONUMENT. DEVELOPER SHALL PAY FOR ANY RELOCATION OF SERVICES AND/OR METER BOXES FOUND TO FALL WITHIN 12 INCHES OF A SURVEY MONUMENT LOCATION.

NO.	REVISIONS	DATE	BY
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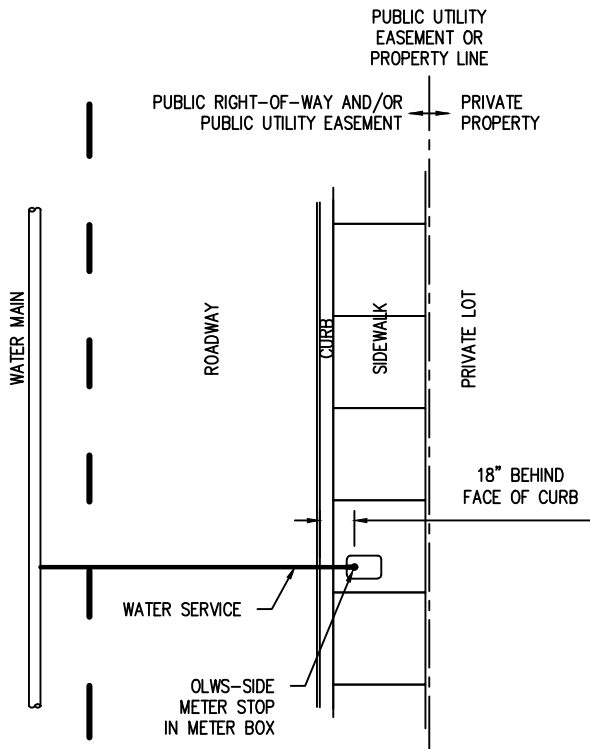
1st PREFERENCE – METER BOX LOCATED IN PLANTER STRIP



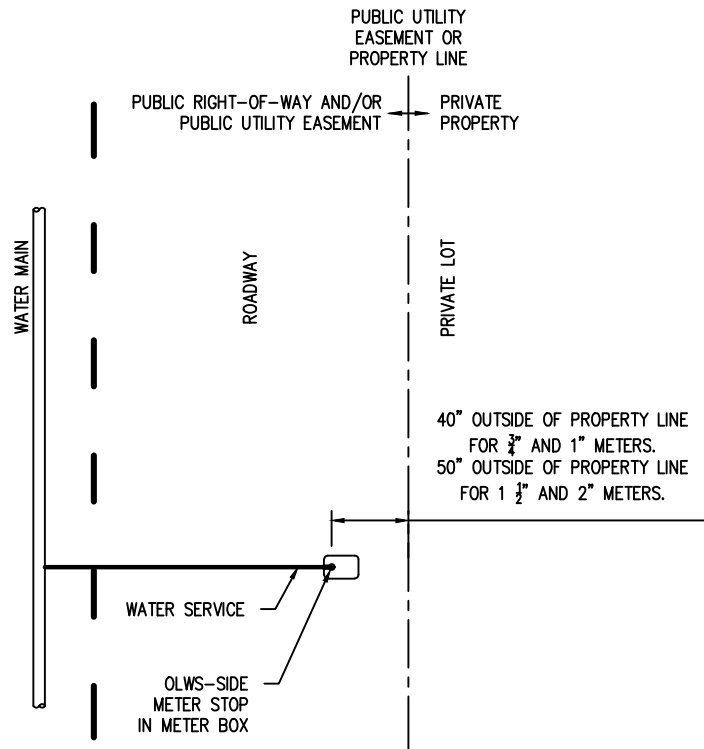
2nd PREFERENCE – METER BOX LOCATED BEHIND SIDEWALK



3rd PREFERENCE – METER BOX LOCATED IN SIDEWALK



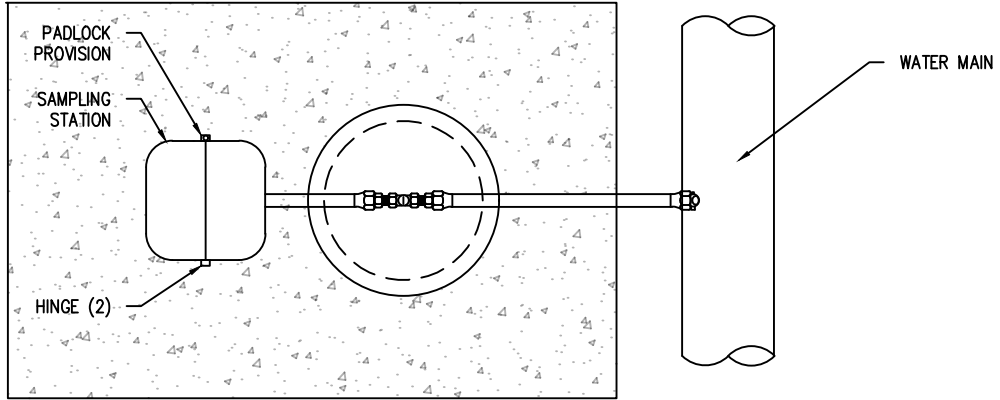
4th PREFERENCE – NEITHER CURB NOR SIDEWALK PRESENT



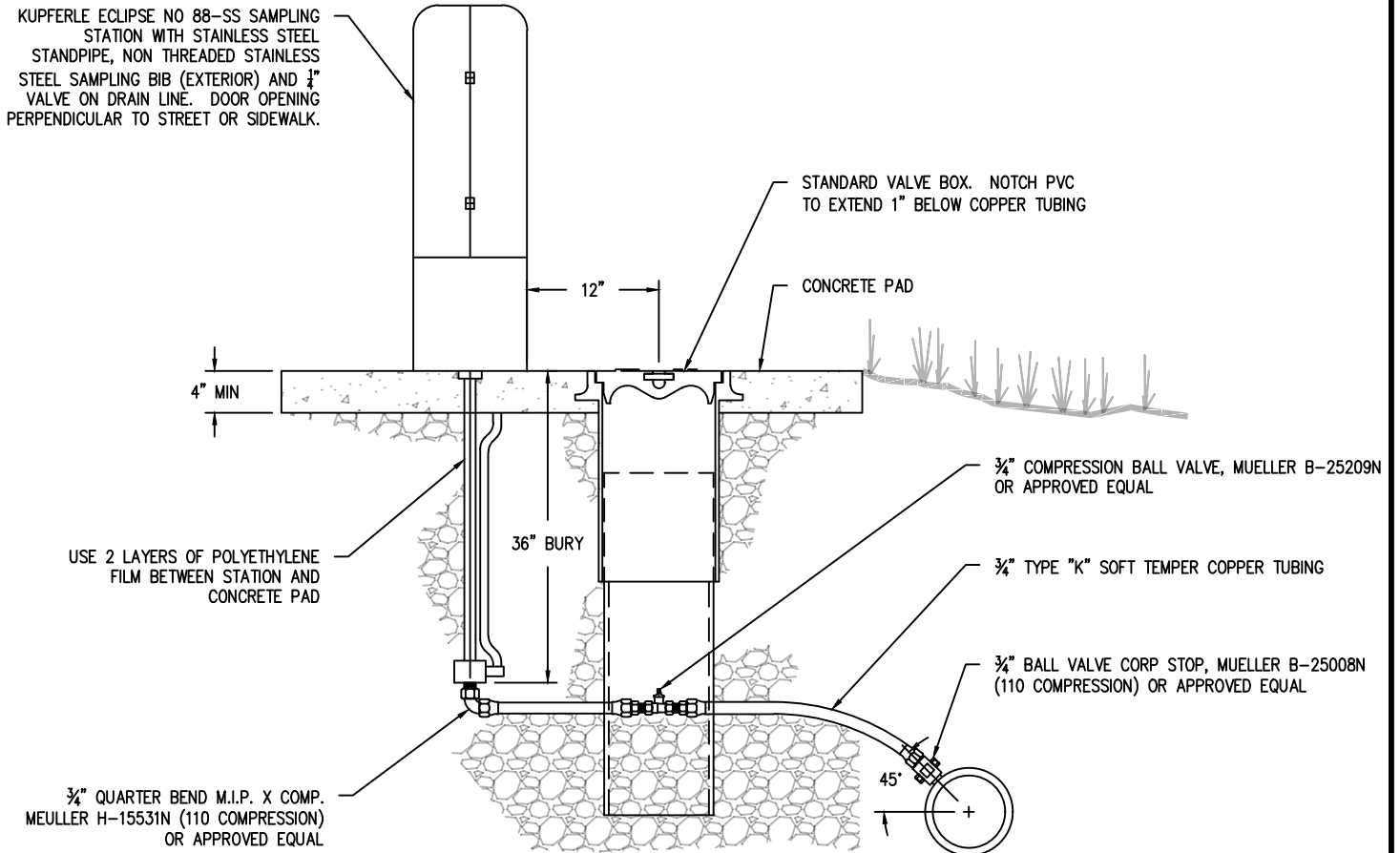
NO.	REVISIONS	DATE	BY
1	EVERYTHING	02/18/2020	HSD
2	DRAWING NUMBER	12/14/2020	HSD
3			
4			

PUBLIC UTILITY EASEMENT
OR PROPERTY LINE

PRIVATE ← PUBLIC



KUPFERLE ECLIPSE NO 88-SS SAMPLING
STATION WITH STAINLESS STEEL
STANDPIPE, NON THREADED STAINLESS
STEEL SAMPLING BIB (EXTERIOR) AND 1/2"
VALVE ON DRAIN LINE. DOOR OPENING
PERPENDICULAR TO STREET OR SIDEWALK.



- NOTES:
1. PIPE ZONE MATERIAL SHALL BE 3/4"-0" CRUSHED ROCK GRANULAR BACKFILL COMPACTED TO 95% OF AASHTO T-99.
 2. WHEN CROSSING CATHODICALLY PROTECTED SYSTEM, INSTALL PVC SLEEVE
 3. WHERE NO SIDEWALK EXISTS, PLACE CONCRETE PAD AS SHOWN. WHERE SIDEWALK EXISTS, PLACE MIN. 12" AROUND BACK OF SAMPLE STATION AND INCORPORATE INTO NEW CONCRETE POUR.
 4. COLOR: STOCK GREEN

OAK LODGE
WATER SERVICES

WATER SYSTEM STANDARD DRAWING

WATER SAMPLING STATION

DRAWING NO.

435

NO.	REVISIONS	DATE	BY
1			
2			
3			
4			

DATE: 7/30/2024

SCALE: NTS