WATER & SEWER NOTES

1. Water mains are to be installed in accordance with the construction and material specifications as detailed in the Medina County Sanitary Engineers Rules and Regulations. All bends, tees crosses, valves, hydrants, and appurtenances shall be thrust blocked and have restrained joints.

2. All PVC or Ductile Iron water main trenches within a 1:1 slope of existing or future pavements (Zone of Influence) is to be backfilled with #411 crushed limestone for State Highways, #57 crushed limestone to within one foot (1') of the pavement base topped off with #304 crushed limestone for County Highways, or meet the requirements of the authority having highway maintenance responsibility. Trench conditions for type "K" copper waterline (1" or larger service connection) shall be backfilled with #310 bank run gravel for one foot, then #57 crushed limestone topped off with #304 crushed limestone to the pavement base for County Highways, or meet the requirements of the authority having highway maintenance responsibility.

3. Minimum depth of cover shall be five feet (5') unless otherwise noted.

4. A six inch (6") hydrant assembly shall include the tee, valve, pipe, a standard six inch (6") hydrant, thrust blocking, anchor couplings at all joints, and necessary offset to set hydrant to proper grade. Hydrants shall be Mueller Centurion Model A-423, A.V.K. Model 2780, or Kennedy K-81D; 5¼" valve opening; minimum 200 P.S.I. operating pressure.

5. In the testing of a new water main installation, where it is connected to an existing water main for the test, failure of the test or any damage to the existing facilities shall be the sole responsibility of the contractor.

6. The contractor shall assume full responsibility for making all necessary arrangements with all utility companies.

7. The contractor shall provide a six foot by six foot (6'x6') I.D. plywood or boxed sheeted chlorination pit at various locations as specified by the Medina County Sanitary Engineers. The MCSE will perform chlorination and final flushing following completion of pressure and leakage test by the contractor.

8. The contractor shall make arrangements with the MCSE department for the installation of all water connections. Prior to paving, the MCSE department shall make the water taps and install the connections to one foot (1') beyond the utility easement with a curb stop and box. All excavation and backfill will be performed by the contractor.

9. All water service connections shall be maintained at a minimum of four feet (4') of cover. At the end of each curb box a four inch by four inch by eight foot (4"x4"x8') long treated lumber shall be buried four feet (4') deep (leaving four feet (4') exposed). **NOTE: The sublot number or city lot number (whichever is applicable) must be permanently displayed on the front of each four by four (4x4) before final inspection of the project.

10. Minimum horizontal separation between water main and storm sewers is four feet (4'). Minimum horizontal separation between water main and sanitary sewers is ten feet (10'). When this condition cannot be met, the bottom of the water main must be at least eighteen inches (18") above the top of sewer, or the sewer must have joints equivalent to the water main standards and must be pressure tested.

11. A final inspection by the MCSE of all water mains is required. Inspection requirements for acceptance of the water lines are:
    A. A hydrostatic pressure and leakage test per MCSE standard specs.
    B. A disinfection (chlorination) test per MCSE standard specs

12. Costs for all tests relative to testing and inspection shall be borne by the developer (owner).

13. All fittings to be mechanical joint. Resilient Wedge Gate Valves must be Mueller series A-2360-20, A.V.K. Series 25, or Kennedy Kenseal II; minimum 250 P.S.I. operating pressure.

14. Prior to performing tap and installing the individual water service connections, the developer shall pay the current permit and meter fees.

15. Pipe Specifications:

Water Main Material	A.W.W.A. Specifications	Sizes	Class
Ductile Iron Cement Lined	A.W.W.A C-151-76	4" - 12"	52
Ductile Iron Cement Lined Pressure Class (Use a MCSE approved Restrainer Gland with all fittings)	A.W.W.A. C-151	14" - 64"	350
PVC Pressure Pipe	A.W.W.A. C-900-75	4" - Up	150
PVC Pressure Pipe (When using PVC C-900 or C-909 with Ductile iron valves or fittings UNI-FLANGE 1300 restrainer glands or approved equal must be used)	A.W.W.A. C-909-02	4" - 12"	200

16. Polyethylene Encasement:
    All mechanical joints, all restrained mechanical joints, all valves, all pipe, and fittings where shown on the drawing, or where required, shall be polyethylene encased. Polyethylene Encasement for mechanical joints, restrained mechanical joints, or any joint requiring bolts, shall be generally in accordance with American Nation Standard ANSI/A.W.W.A. C105/A21.5-82 for Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids. Mechanical joints, restrained mechanical joints, and all bolted joints shall have double Polyethylene Encasement of class "C" (black) film, method "C" doubling sheet and providing one foot (1') minimum overlap on pipe or fitting on both sides of joint. All pipe and fittings where shown on the drawings or where otherwise required to be Polyethylene Encased shall be encased in using class "C" film, method "B". Polyethylene Encasement shall be securely taped snug around pipe and fittings.

17. Painting and Stainless Steel Bolts:
    After erection and before polyethylene encasement, all exposed or damaged coating shall be cleaned and painted with three (3) field coats of Interlol 50, Bitumastic 50, or equivalent. All bolts exposed to the ground shall be 316 stainless steel, including valve and packing nuts/bolts, mechanical "T" bolts, and bolts used on Mega-Lug anchors. Field painting of stainless steel items will not be required.

18. Standard plastic tracer tape is to be buried approximately four feet (4') directly above water line to facilitate its location at a later date.

19. The installation of Polyvinyl Chloride (PVC) pressure pipe and fittings for water mains shall follow ANSI/A.W.W.A. C 605.

20. The disinfection of water mains shall follow ANSI/A.W.W.A. C 651.

21. The installation of Ductile Iron (D.I) pressure pipe and fittings for water mains shall follow ANSI/A.W.W.A. C 600.

22. All valves and hydrants must be from the same manufacturer (i.e. Mueller valves and Mueller hydrants, not Kennedy valves and Mueller hydrants).

1. All manholes shall be set to grade per the manhole schedule by the sewer contractor at the time of installation. The final adjustment of the castings shall be the responsibility of the paving contractor and the final inspection, approval and acceptance of the sewer system by the Medina County Sanitary Engineer Department and Medina City or County Engineer where applicable shall be contingent upon this final adjustment of the casting.

2. All manholes shall be constructed of precast reinforced concrete with compression (premium) type joints. In addition to premium joints, all riser ledges must have a layer of either mastic roping, flexible tar mastic, or butyle strips.

3. All sanitary sewers and appurtenances shall be constructed in accordance with the Medina County Sanitary Engineering Department standards.

4. Sanitary sewer house connections shall be four inch (4") PVC (same as sanitary specifications). Sanitary sewer connections to be laid at a minimum slope of 1.00% and carried to a point one foot (1') beyond the utility easement. Roof drains, foundation drains, and other clean water connections to the sanitary sewer system are prohibited.

5. R.C.P. and P.V.C. Trench Conditions:
    A. Use Class 'II' bedding per O.D.O.T. section 603.06. The material for this bedding shall meet O.D.O.T. specifications for #8 limestone.
    B. Trenches within a 1:1 slope of existing or future pavements (Zone of Influence) is to be backfilled with #411 crushed limestone for State Highways, #57 crushed limestone to within one foot (1') of the pavement base topped off with #304 crushed limestone for County Highways, or meet the requirements of the authority having highway maintenance responsibility.
    C. For P.V.C., modify O.D.O.T. section 603.06 to carry the bedding material to a minimum of six inches (6") above the pipe.
    D. For R.C.P., bedding material shall be #57 limestone, for R.C.P. modify section 603.06 to carry bedding material to a minimum of half the pipe outside diameter (see trench section on standard detail in the plans).
    E. If fill is to be constructed below the sanitary sewer, compaction tests indicating 95% compaction must be performed and observed by the M.C.S.E. and submitted for approval before construction of any sanitary sewer within said fill area can begin.

6. Testing:
    A. Photographic or T.V. inspection of all sanitary sewers and passage of standard infiltration test shall be required before the acceptance of the sanitary system by the Medina County Sanitary Engineers Department.
    B. Deflection tests will be run on all P.V.C. pipe, not less than 30 days after final backfill has been placed. No pipe shall exceed a deflection of 5%. These test shall consist of pulling a "GO-NO/GO" Mandrel through the line, The contractor has the option of:
        1. A testing company certified by the MCSE performing said work.
        2. The contractor performing the work under county supervision.
    C. Maximum allowable leakage inward, or outward (Infiltration or Exfiltration) for any sanitary sewer section tested, including all manholes, is 100 gallons per inch of diameter per mile of pipe per day. Manholes may be tested separately. The above allowable leakage rate is equivalent to 0.08 gallons per inch of diameter per 100 feet of pipe per hour.
    D. Low pressure air testing will be required on all main line sanitary sewer, laterals, and manholes, per MCSE Rules and Regulations (Resolution 07-874).
    E. All costs relative to the above tests shall be borne by the contractor.

7. Pipe Specifications:

Sanitary Sewer Pipe	Material Specs & Size	Joint Specs	Lateral Specs	Minimum Pipe Stiffness or SDR
Truss pipe Polyvinyl Chloride (PVC)	8" - 15" ASTM D2680	ASTM D3212 Compression Type	ASTM 3034	200 P.S.I.
Solid Wall Polyvinyl Chloride (PVC)	4" - 15" ASTM D3034 18" - 27" ASTM F679	ASTM D3212 Compression Type	ASTM 3034	SDR 35
PVC Force Main Polyvinyl Chloride	2" -18" ASTM D2241	ASTM F477 or D3139	N/A	SDR 21
Profile Wall Polyvinyl Chloride (PVC)	18" - 36" ASTM D1784 Cell Classification 12454C, 12454A, 12364A, 12364C	ASTM F477	ASTM 3034	46 P.S.I.
Reinforced Concrete (RCP)	36" - 96" ASTM C76	ASTM C443	ASTM 3034	Class IV & Class V (As shown on plans)

8. Sewers shall be deep enough to receive wastewater from basements, and to prevent freezing.

9. Sewers shall be laid with uniform slope between manholes.

10. Manholes shall be installed at the end of each line; at all changes of grade, size, and alignment; all intersections; and all distances less than 400'. However, MCSE can test up to 750'.

11. Water tight manhole covers shall be used where the manhole tops may be flooded by street run-off or high water. Inlet and outlet pipes shall be joined to the manhole by a gasketed, flexible, water tight connection.

GENERAL NOTES

1. Underground facilities, structures, and utilities have been plotted from available surveys and drawings from various sources. Therefore, their locations must be considered approximate only. Also, there may be others, the existence of which is not presently known. The Board of County Commissioners of Medina County and the Medina County Sanitary Engineering Department expressly disclaims any responsibility for the accuracy and completeness of information given regarding existing underground utilities.

2. The owner offers the existing underground information as shown on the profile sheets as a guide only, but does not guarantee or assume any liability implied or otherwise for the accuracy of information given hereon. It shall be the contractor's responsibility to ascertain for himself the conditions that he may encounter during completion of the project.

3. All survey centerline locations for ground control will be established by the engineer. During construction, the survey centerlines, offset locations, hubs, stakes, flags, markers, pins, and/or reference points must be protected by the contractor. If it is necessary to reset any hubs, stakes, flags, markers, pins, and/or reference points which have been disturbed, the contractor shall pay the engineer all such costs of restaking at prevailing wage rates.

4. All existing property pins, rods, monuments, monument boxes, and/or benchmarks in the construction area must be protected at all times. It shall be the responsibility of the contractor to re-establish those items disturbed by his work, by using his own engineering forces, and/or as directed by the engineer at no additional cost to the owner.

5. The contractor shall visit the site and become familiar with the existing conditions prior to placement of his bid for the project.

6. Blasting will not be permitted unless approved by the owner.

7. All abandoned pipes shall be bulkheaded and filled with grout.

8. Existing catch basins, where disturbed, shall be reset to finished grade, or pavement elevation as directed by the engineer.

9. All utility services shall be maintained throughout the construction period.

10. All manholes, catch basins, monument rims, valve boxes, castings, and covers shall be adjusted to finished pavement elevations, final grade or as directed by the engineer.

11. The contractor shall submit shop drawings for approval before any work can commence.

12. The contractor shall verify all dimensions and conditions related to existing construction, existing services, temporary service, and the site.

13. The contractor shall be responsible for the design, installation, and final clearance of any required needling, underpinning, shoring or bracing of existing structures.

14. Notify the engineer of any unusual soil conditions, such as springs or seepage of water encountered, or where a different bearing material is evident and there is a question of the bearing capacity.

15. See Specifications Book for: Quality of construction required, performance levels of workmanship, manufacturing and industrial standards, strength regulations, and guarantee requirements.

16. Minor alignment changes may be required during construction due to possible utility conflicts, as directed and/or approved by the engineer.

17. No supplemental clauses, conditions, notations, or stipulations by the bidders shall be permitted on or attached to the bid proposal.

18. Errors in bidding computations shall be at the peril of the bidder. All errors shall be resolved as most favorable to the owner and the successful bidder waives any and all claims against the owner or right of reformation of the bid after the public opening of the bids.

19. The contractor is to confirm the invert elevations of all existing sewers affected by his work prior to commencement of work and report all findings to the engineer.

20. Paving and/or resurfacing work shall not be scheduled for completion until prior approval of the contractor's progress schedule has been granted or directed by the engineer.

21. The contractor shall obtain highway use permits from the Medina County Highway Engineer prior to construction on township or county roads. The Medina County Sanitary Engineer will obtain O.D.O.T. permits for work in State of Ohio roadways.

22. Work limits shall be limited to within the Right-of-Way. All of the contractor's operations must be confined within the existing street's Right-of-Way limits or existing easements acquired by the owner. Any additional construction easements needed for completion of his work must be secured from the property owners by the contractor at his expense and at no additional cost to the owner.

23. Excess excavation for the project shall be wasted on the project site as directed by the engineer, or excess excavation not wasted on the job site shall be hauled away by the contractor at his expense at no additional cost to the owner. Materials disposed of off-site must be disposed in an environmentally sound fashion and in accordance with all local, state, and federal regulations.

24. Trees: All trees shall be saved unless otherwise noted, or as directed by the engineer. Extreme caution must be taken to protect trees. Any damage to the trees must be repaired and the method of repair must receive prior approval from the engineer.

25. Restoration of the work area: Before release of the final payment a complete review of the entire work area will be made to verify the area is restored to pre-construction condition or better.

26. The locations of the underground utilities shown on the plans are as obtained from the owners of the utility, as required by section 153.64 Ohio Revised Code. At least two (2) working days prior to commencing construction operations, in an area which may involve underground utility facilities, the Ohio Utility Protection Service (OUPS), the Oil & Gas Producers Underground Protection Service (OGPUPS), and the owners of each underground utility facility shown on the plans shall be contacted by the contractor. The owner of the underground utility facility shall, within forty-eight (48) hours, excluding Saturdays, Sundays, and legal holidays, after notice is received, staked, mark or otherwise designate the location of the underground utility facilities in the construction area in such a manner as to indicate their course together with the approximate depth at which they were installed. The marking or locating shall be coordinated to stay two (2) days ahead of the planned construction.

27. Sanitary sewers are to be separated from existing and proposed potable water lines by a minimum horizontal distance of ten feet (10'), outside of pipe to outside of pipe. In instances where water and sewer line must cross, the water line is to maintain a vertical distance of eighteen inches (18") above the sanitary sewer, outside of pipe to outside of pipe.

28. All construction equipment shall be equipped with mufflers in accordance with federal safety standards.

29. All heavy equipment on road surfaces shall include metal or rubber pavement tracks.

OHIO EPA GENERAL NOTES

1. A minimum 35 PSI pressure shall be delivered to the curb stop boxes during normal operating conditions for all water service connections.

2. Booster pumps are not permitted on water service connections.

3. The sanitary sewers must pass a leakage test which shall be a low pressure air test in accordance with the "Ten State Standards" section 33.95 and ASTM F-1417 hydrostatic testing will have a leakage limit of 100 Gal./In./Mi./Day.

4. All sanitary manholes shall be air tested per ASTM specification C 1244-93 to verify water tightness and proper construction per plan details.

5. All flexible sanitary sewers must pass a deflection test (5% Max.)

    Deflection tests shall be performed no sooner than 30 days following completion of backfill. Maximum ring deflection of the pipe under load shall be limited to 5% of the average inside diameter listed in ASTM D-2751 for ABS solid wall pipe and ASTM D-2680 for ABS composite wall pipe. ASTM-3034 for Polyvinyl Chloride (PVC) pipe lists outside dimensions and minimum wall thicknesses which may be used to calculate applicable base diameters. The proper sized mandrels shall be pulled through the pipe.

    All pipe failing to maintain the minimum deflection diameter or larger for the applicable type of pipe shall be considered to have been improperly installed and shall be relayed or replaced by the contractor at their expense.

6. All water mains shall be installed and pressure tested per AWWA C600.

7. All water mains shall be disinfected per AWWA C651.

8. The following minimum horizontal separations (measured out-to-out clear) between the proposed water line and the sewers shall be maintained:
    A. 4 foot separation from the storm sewer
    B. 10 foot separation from the sanitary sewer

9. The following minimum vertical clearances (measured out-to-out clear) between the proposed water line and the sewers shall be maintained:
    A. 12 inch clearance from the storm sewer
    B. 18 inch clearance from the sanitary sewer

Water Lines Sanitary Sewers Storm Sewers	County of Medina 791 West Smith Road Medina, Ohio 44256 (216) 225-3113 or (330) 723-9575 Rural Lorain County Water Authority P.O. Box 567 LA Grange, Ohio 44050 (216) 355-5121
OUPS	Registered underground Utilities Protection Service 1-800-362-2764
OGPUPS	The Oil & Gas Producers Underground Protection Service 1-800-925-0988

Additional Notes for Townships and County Highways:

Medina County Highway Engineer inspectors will periodically check that:

1. Signs & Flaggers (Patrolmen) are used every day.
2. The road is washed every day.
3. The excavated area is closed or plated daily.
4. Premium fill is used if the trench is within 5'-0" of the edge of the pavement.
5. Trench boxes & ladders are used as required by M.C.H.E.
6. All equipment is parked 10'-0" minimum from the pavement edge.

CAUTION:
Contact all utilities before beginning construction (Refer to General Note #26).

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COUNTY: MEDINA
DRAWN BY:
TOWNSHIP: VARIOUS
REVIEWED BY:
DATE: AUGUST 2010
SCALES : N/A / N/A

DATE	DESCRIPTION	BY:

GENERAL NOTES

- PLAN PREPARED BY -
MEDINA COUNTY
SANITARY ENGINEER
JAMES F. TROIKE, P.E.
791 WEST SMITH RD.
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(330)725-9565 - (330)225-3113

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PROJECT NUMBER

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SHEET NUMBER

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