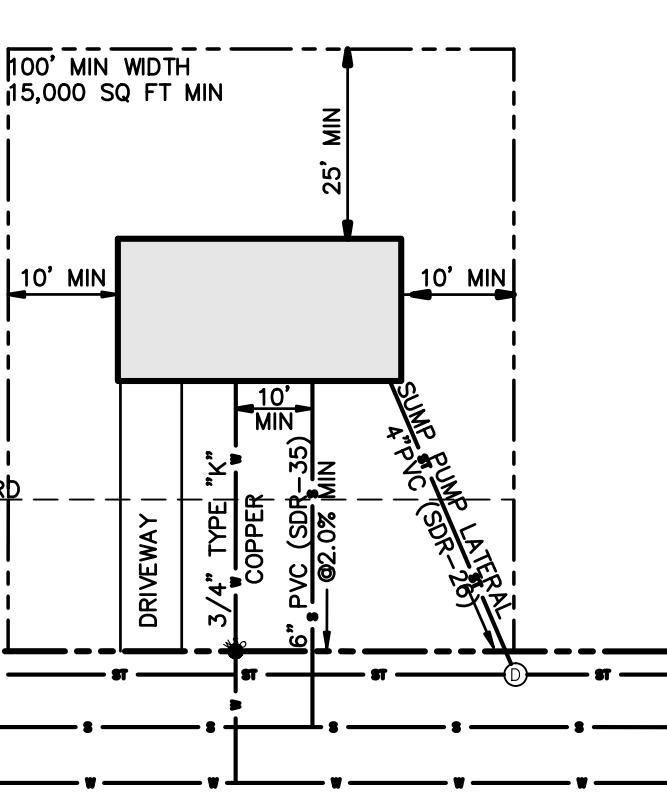


LEGEND:

- EXISTING LOT LINE
- LOT LINE
- SETBACK LINE
- EASEMENT LINE
- IRON ROD FOUND
- IRON PIPE FOUND
- HYDRANT
- WATER MAIN
- SEWER LINE
- WATER COURSE OR SURFACE WATER BOUNDARY
- FEDERAL WETLAND BOUNDARY
- TREE LINE
- TREE TYPE
- WATER/SEWER DISTRICT LINE
- SUMP PUMP LATERAL
- PROPOSED STORM SEWER CATCH BASIN W/ GRATE
- PROPOSED STORM SEWER MANHOLE W/ COVER
- PROPOSED STORM SEWER END SECTION WITH RIP RAP APRON
- PROPOSED DUCTILE IRON WATER MAIN, HYDRANT, GATE VALVE & TEE
- PROPOSED SANITARY SEWER MANHOLE W/ COVER
- PROPOSED LOT STREET NUMBER
- PROPOSED PROPERTY LINE CURVE DATA (REFER TO CURVE TABLE)
- PROPOSED PROPERTY LINE DATA (REFER TO LINE TABLE)
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED WATER SERVICE LATERAL

MATCH LINE - SEE SHEET S2.3C



**TYPICAL
SINGLE FAMILY
LOT LAYOUT**
RA ZONING DISTRICT ONLY

TESTING WATER MAINS:

1. AFTER TRENCH HAS BEEN BACKFILLED, HYDROSTATIC ACCEPTANCE TESTS, CONSISTING OF A PRESSURE TEST, SHALL BE CONDUCTED ON THE TRENCH SECTION OF THE SYSTEM. IF WATER MAINS INSTALLED, LEAKAGE TEST SHALL BE CONDUCTED CONCURRENTLY WITH PRESSURE TEST. TEST SECTION SHALL BE LIMITED TO ABOUT 2000 FT (MAX) UNLESS OTHERWISE APPROVED BY THE ENGINEER.

2. ALL TESTS AND INSPECTIONS HAVE BEEN PERFORMED EVIDENCE OF COMPLIANCE SHALL BE FORWARDED TO OWNER/ENGINEER AND THE MUNICIPALITY PRIOR TO ACCEPTANCE.

3. ALL WATER FOR TESTS SHALL BE FURNISHED AND DISPOSED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. SOURCE AND/OR QUALITY OF WATER WHICH THE CONTRACTOR PROPOSES TO USE IN TESTING LINES SHALL BE ACCEPTABLE TO THE ENGINEER.

4. HYDROSTATIC PRESUMPTIVE TESTS MAY BE PERFORMED WHEN SYSTEM IS PARTIALLY BACKFILLED TO SIMPLY CHECK WORK, BUT ACCEPTANCE OF SYSTEM SHALL BE BASED ON HYDROSTATIC TESTS. SYSTEM TESTS SHALL BE CONDUCTED ONCE FULLY BACKFILLED. ALL HYDROSTATIC TESTS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600 OR LATER ADDITION, AS MODIFIED HEREIN.

5. FOR THE PRESSURE TEST, SYSTEM SHALL BE PRESSURIZED AND MAINTAINED AT A MINIMUM OF 150 PSI FOR A QUANTITY OF TIME, THE WORKING PRESSURE, WHOEVER IS GREATER, BASED ON THE ELEVATION OF THE LOWEST POINT IN THE SECTION BEING TESTED AND CORRECTED TO ELEVATION OF THE GAUGE. LEAKAGE TEST DURATION SHALL BE A MINIMUM OF 2 HOURS.

6. LEAKAGE TEST SHALL BE PERFORMED CONCURRENTLY USING A MINIMUM TEST PRESSURE OF 100 PSI, OR 0.43 OF THE WORKING PRESSURE, WHOEVER IS GREATER, BASED ON THE ELEVATION OF THE LOWEST POINT IN THE SECTION UNDER TEST AND CORRECTED TO ELEVATION OF THE GAUGE. LEAKAGE TEST DURATION SHALL BE A MINIMUM OF 2 HOURS.

7. MAXIMUM ALLOWABLE LEAKAGE SHALL BE AS SHOWN IN THE FOLLOWING TABLE:

AVG. TEST PRESSURE	NOMINAL PIPE DIAMETER-IN.	4	6	8	10	12	14	16
450	0.57	0.86	1.15	1.43	1.72	2.01	2.29	
400	0.53	0.81	1.03	1.31	1.59	1.87	2.16	
350	0.51	0.76	1.01	1.26	1.52	1.77	2.02	
300	0.49	0.70	0.97	1.17	1.41	1.67	1.97	
275	0.45	0.67	0.90	1.04	1.34	1.57	1.79	
250	0.43	0.64	0.85	1.07	1.28	1.50	1.71	
225	0.41	0.61	0.81	1.01	1.24	1.45	1.62	
200	0.38	0.57	0.76	0.99	1.15	1.34	1.53	
175	0.36	0.54	0.72	0.89	1.07	1.24	1.43	
150	0.33	0.50	0.69	0.89	1.06	1.24	1.42	
125	0.30	0.45	0.60	0.76	0.91	1.06	1.21	
100	0.27	0.41	0.54	0.68	0.81	0.95	1.08	

8. IF LEAKAGE IN SYSTEM EXCEEDS THE SPECIFIED AMOUNT, THE CONTRACTOR SHALL, AT NO ADDITIONAL COST, TO THE OWNER, LOCATE, REPAIR, AND/OR REPLACE DEFECT(S) AND RE-TEST PIPING SYSTEM.

DISINFECTION OF POTABLE WATER SERVICE MAINS:

1. DISINFECTION WILL BE ACCOMPLISHED AFTER PIPE HAS PASSED ANY LEAKAGE TESTS.

2. THE MUNICIPALITY AND THE ENGINEER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE START OF PRESSURE TESTING, LEAKAGE TESTING, AND DISINFECTION.

3. DISINFECTION WILL BE PERFORMED IN ACCORDANCE WITH AWWA STANDARD C 651-05 OR LATER ADDITION. (EXCLUDING SECTION 4.4.2 COVERING THE TABLET METHOD).

TESTING GRAVITY SEWER SYSTEM:

1. CONTRACTOR SHALL INSPECT AND TEST THE INSTALLATIONS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION PRIOR TO ACCEPTANCE. AFTER ALL TESTS HAVE BEEN PERFORMED, EVIDENCE OF COMPLIANCE SHALL BE FORWARDED TO OWNER/ENGINEER AND THE AUTHORITY HAVING JURISDICTION PRIOR TO ACCEPTANCE.

2. THE CONTRACTOR SHALL TEST AND INSPECT FOR ALIGNMENT, INFILTRATION AND EXTRUSION TESTS. THE SANITARY SEWER SYSTEM SHALL NOT EXCEED 0.80 GAL/INCH OF INTERNAL PIPE DIAMETER PER 1000' OF PIPELINE PER HOUR WITH A MINIMUM HEAD OF 10' AND 0.05 GALLONS PER SECOND. IF EXTRUSION OCCURS BY THE AUTHORITY HAVING JURISDICTION, WHEN INFILTRATION OR EXTRUSION OCCURS IN EXCESS OF ALLOWABLE AMOUNT, DEFECTS SHALL BE LOCATED AND REPAIRED.

3. INFILTRATION LEAKAGE TESTS SHALL BE RUN ON EACH SINGLE MANHOLE-TO-MANHOLE SECTION. THE CONTRACTOR SHALL INSPECT AND TEST ALL PIPE AND FITTINGS BETWEEN THE TWO MANHOLES PLUS THE UPSTREAM MANHOLE.

4. EACH MANHOLE SECTION SHALL BE REJECTED OR ACCEPTED BASED ONLY ON REASONABLE TESTS. THE CONTRACTOR SHALL NOT TEST SEVERAL CONSECUTIVE MANHOLE SECTIONS SIMULTANEOUSLY OVER MORE THAN ONE CONSECUTIVE MANHOLE-TO-MANHOLE SECTION. THE ONLY EXCEPTION ALLOWED: ACCEPTING SEVERAL CONSECUTIVE MANHOLE SECTIONS BASED ON ON-LINE COMBINED INFILTRATION TEST INDICATING ZERO INFILTRATION.

5. INFILTRATION TESTS SHALL BE MADE BY INSTALLING A FLAT PLATE DRAIN IN THE DOWNSTREAM MANHOLE OF SECTION REJECTED. TEST DURATION SHALL BE 15 HRS, OR FOR SHORTER PERIOD, PROVIDED A STEADY STATE FLOW CONDITION HAS BEEN ACHIEVED IN THE TEST PERIOD, AND RESULTS PROJECTED FOR 24 HRS.

6. EXTRUSION TESTS SHALL BE RUN ON EACH MANHOLE-TO-MANHOLE SECTION. A PIPELINE SECTION UNDER TEST SHALL INCLUDE ALL PIPE AND FITTINGS BETWEEN THE TWO MAN-HOLES PLUS THE UPSTREAM MANHOLE.

7. INFILTRATION TESTS SHALL BE MADE BY MEASURING THE DROP IN WATER ELEVATION IN THE UPSTREAM MANHOLE. THE CONTRACTOR SHALL MEASURE THE WATER ELEVATION LEVEL IN UPSTREAM MANHOLE SHALL BE 2 FEET HIGHER THAN EITHER THE TOP OF PIPE OR GROUNDWATER LEVEL. THE CONTRACTOR SHALL NOT TEST SEVERAL CONSECUTIVE MANHOLE SECTIONS DURING AN INFILTRATION TEST AND MAY TEST THE NEXT ADJACENT SECTION, BOTH UPSTREAM AND DOWNSTREAM, DRY AND NOT UNDER TEST. THIS PROCEDURE MINIMIZES HYDROSTATIC PRESSURE PLACEMENTS, PLUGS, AND VALVES.

8. LOW PRESSURE AIR TESTS MAY BE ALLOWED IN LIEU OF INFILTRATION TESTS ONLY WHEN SO ALLOWED. TEST SHALL BE PERFORMED UNDER DIRECTION OF ENGINEER ACCORDING TO ASTM F1417. LOW PRESSURE AIR TEST IS A COMPARISON OF THE MEASURED TIME NEEDED TO DRAIN A TEST SECTION AND THE TIME NEEDED TO DRAIN A TEST SECTION AT THE ALLOWABLE RATE FOR THAT PRESSURE DROP TO OCCUR DETERMINED BY METHODS INDICATED IN ASTM F1417. THE ONE (1) PSIG PRESSURE DROP OCCURS FASTER THAN ALLOWABLE TIME, SECTION IS UNACCEPTABLE.

9. AN AIR TEST SHOT NOT BE A UNIT SECTION OF LINE TO BE TESTED HAS BEEN CLEARED OF ALL FOREIGN MATERIALS BY FLUSHING AND HAS BEEN VISUALLY INSPECTED AND APPROVED BY THE ENGINEER CERTAIN PIPE MATERIALS PRODUCE MORE CONSISTENT RESULTS WHEN INTERIOR OF PIPE IS WETTED PRIOR TO TESTING.

10. WHERE FLEXIBLE PIPE IS USED, CONTRACTOR SHALL TEST ALL MANHOLE PIPE FOR MAXIMUM ALLOWABLE DEFLECTION OF 5% OF OUTSIDE DIAMETER. DEFLECTION TESTS SHALL BE PERFORMED USING A CIRCULAR STEEL BALL ON SLICE 1/16-INCH IN DIAMETER SMALLER THAN ALLOWABLE DEFLECTION. DEFLECTION TESTS SHALL NOT BE CONDUCTED ON 100% OF OUTSIDE DIAMETER. DEFLECTION TESTING OF ANY PIPE SHALL BE DONE NO SOONER THAN 30 DAYS AFTER PIPE INSTALLATION. PIPE SECTION UNLESS WRITTEN EXCEPTION.

11. WHERE FLEXIBLE PIPE IS USED, CONTRACTOR SHALL TEST ALL MANHOLE PIPE FOR MAXIMUM ALLOWABLE DEFLECTION OF 5% OF OUTSIDE DIAMETER. DEFLECTION TESTS SHALL BE PERFORMED USING A CIRCULAR STEEL BALL ON SLICE 1/16-INCH IN DIAMETER SMALLER THAN ALLOWABLE DEFLECTION. DEFLECTION TESTS SHALL NOT BE CONDUCTED ON 100% OF OUTSIDE DIAMETER. DEFLECTION TESTING OF ANY PIPE SHALL BE DONE NO SOONER THAN 30 DAYS AFTER PIPE INSTALLATION. PIPE SECTION UNLESS WRITTEN EXCEPTION.

12. SEWERS SHALL BE LAID WITH STRAIGHT ALIGNMENT BETWEEN MANHOLES. STRAIGHT ALIGNMENT TESTS SHALL BE CONDUCTED PRIOR TO TEST. ALIGNMENT TESTING SHALL COMPLY WITH REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

13. MANHOLES, WHICH CANNOT BE PROPERLY AIR TESTED, SHOULD BE VISUALLY INSPECTED AND LEAKAGE TESTED USING INTERNAL OR EXTERNAL HYDROSTATIC PRESSURE LEAKAGE TESTING SHALL COMPLY WITH REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

14. IN AREAS WHERE CONVENTIONAL TESTING IS IMPRACTICAL (I.E. AREAS DESCRIBED BY ENGINEER AS BEING IN SEWER AREAS WHERE CONVENTIONAL TESTS ARE NOT POSSIBLE AND MAY BLOCKAGE COULD RESULT IN HEALTH PROBLEMS) NO LINES SHALL BE BACKFILLED UNTIL EACH PIPE SECTION AND CONNECTION IS INSPECTED AND APPROVED.

15. WHERE SEWERS ARE CONSTRUCTED OF PRESSURE-RATED PIPE AND INSTALLED WITH LESS THAN 100% HYDROSTATIC TEST, THE CONTRACTOR SHALL TEST THE SEWER LINES. SEWERS SHALL BE HYDROSTATICALLY TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS. HYDROSTATIC ACCEPTANCE TESTS SHALL BE CONDUCTED AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL NOT TEST THE SEWER LINES UNTIL THESE TEST CRITERIA ARE MET.

16. IF THE ALLOWABLE RATE OF INFILTRATION, EXTRUSION, OR AIR LEAKAGE IS EXCEEDED, THE CONTRACTOR SHALL LOCATE POINTS OF EXCESSIVE LEAKAGE AND SHALL PROBABLY CORRECT, REPAIR, AND BRING SYSTEM UP TO THE STANDARD. COSTS OF ALL SUCH REPAIRS AND CORRECTIONS SHALL BE BILLED TO THE OWNER. THE CONTRACTOR SHALL NOT TEST THE SEWER LINE SECTION (INCLUDING MANHOLES AND BUILDING SERVICES) UNDER TEST SHALL NOT BE ACCEPTED UNTIL THESE TEST CRITERIA ARE MET.

**TOWN OF BETHLEHEM
PLANNING BOARD APPROVAL**

ALBANY COUNTY HEALTH DEPARTMENT APPROVAL

ELM AVENUE EAST RESIDENTIAL DEVELOPMENT

**FINAL PLAT
UTILITY PLAN**

TOWN OF BETHLEHEM, ALBANY COUNTY, NEW YORK

drawn	checked
C-B	JML
date	person
2/19/09	2/19/09
project	50-3337.00
sheet no.	30.3337.00

30.3337.00

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