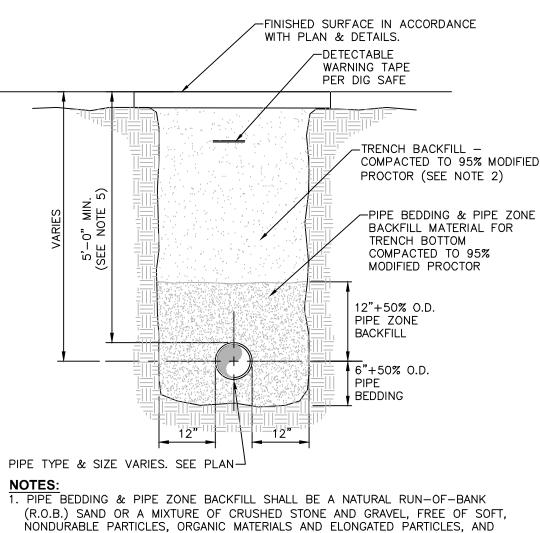


THE PROJECT ENGINEER.



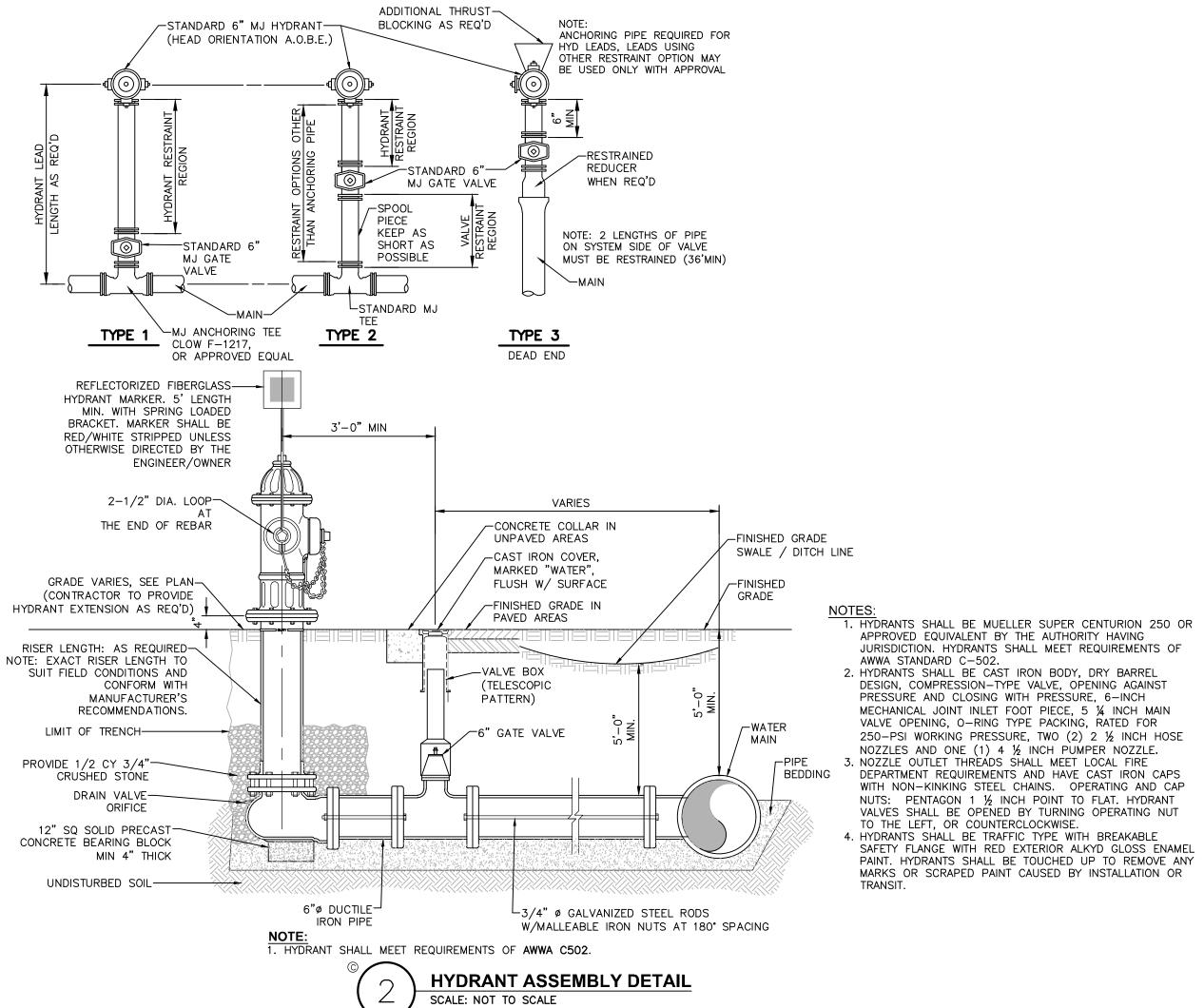
SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. BEDDING GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS: SIEVE DESIGNATION % PASSING 100% 0-70% 2. TRENCH BACKFILL SHALL BE A NATURAL RUN-OF-BANK (R.O.B.) OR PROCESSED GRAVEL, OR EXCAVATED MATERIAL FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE

WELL GRADED FROM FINE TO COARSE PARTICLES. TRENCH BACKFILL GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS: SIEVE DESIGNATION <u>% PASSING</u> 0-70%

IN NON-TRAFFIC UNPAVED AREAS TRENCH BACKFILL CAN BE MATERIALS EXCAVATED FROM THE TRENCH AS APPROVED BY THE ENGINEER AND COMPACTED TO 90% MODIFIED PROCTOR. 3. INSTALL CONTINUOUS DETECTABLE MARKING TAPE DURING BACKFILLING OF TRENCH FOR UNDERGROUND PIPING. LOCATE TAPE 12" BELOW FINISHED GRADE, DIRECTLY OVER PIPING, EXCEPT 6" BELOW SUBGRADE UNDER PAVEMENTS &

4. TRENCHING SHALL BE IMPLEMENTED IN ACCORDANCE WITH O.S.H.A. STANDARDS. 5. 5'-0" MIN COVER SHALL BE APPLIED TO WATER MAIN OR SANITARY SEWER FORCE MAINS ONLY.

PIPE TRENCH DETAIL (TYPICAL) SCALE: NOT TO SCALE



RESTRAINED

SHALL BE RESTRAINED

HORIZONTAL BENDS

RESTRAINED -

DEAD ENDS

(Lr)FULL PIPE

TEE BRANCH -

SHALL BE RESTRAINED

ALL JOINTS WITHIN LENGTH "L"

LENGTH (10ft MIN.RUN) LENGTH (10ft MIN.RUN)

ALL JOINTS WITHIN LENGTH "L"

RESTRAINED

SCALE: NOT TO SCALE

SHALL BE RESTRAINED ON THE TEE

JOINT PIPE DIAGRAMS

SHALL BE RESTRAINED

_ JOINTS WITHIN LENGTH

ALL JOINTS WITHIN LENGTH "L"

LENGTH

REDUCERS

RESTRAINED

T=THRUST FORCE

↑ T=THRUST FORCE

(Lr)FULL PIPE

T=THRUST FORCE

SCHEDULE OF JOINT RESTRAINT- (PVC OR POLYWRAPPED DIP)

LENGTH OF PIPE EACH SIDE OF FITTING TO BE RESTRAINED IN FEET

(INCHES) 90° 45° 22½ 11½ TEE VALVE DEAD 24" 18" 16" 14" 12" 10" 8" 6"

 18"
 149
 62
 30
 15
 122
 125
 125
 26
 49
 68
 85
 99

 16"
 134
 56
 27
 14
 109
 112
 112
 26
 48
 67
 82
 \$

 14"
 118
 49
 24
 12
 95
 98
 98
 26
 47
 64
 7

4" 38 16 8 4 28 31 31

A. BEDDING TYPE 2 - FLAT BOTTOM TRENCH, BACKFILL LIGHTLY

CONSOLIDATED TO CENTER LINE OF PIPE.

COURSE PARTICLES [CL & CL-ML] :

CLAYEY FINE SANDS.

D. DEPTH TO TOP OF PIPE 5'-0" MINIMUM

F. FACTOR OF SAFETY OF 1.5

BE EVALUATED SEPARATELY.

THRUST BLOCK DETAIL)

SIDE OF THE FITTING.

E. MAXIMUM OPERATING PRESSURE OF 150 PSI

SCALE: NOT TO SCALE

1. THE LENGTH OF PIPE REQUIRING RESTRAINT IS BASED UPON THE FOLLOWING

B. SOIL TYPE CLAY 1 - CLAY OF MEDIUM TO LOW PLASTICITY, LL<50, <25%

CL - INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY GRAVELY

ML - INORGANIC SILTS, VERY FINE SAND, ROCK FLOUR, SILTY OR

2. FOR END PLUGS, USE RESTRAIN PIPE LENGTH GIVEN FOR DEAD END FITTING.

3. THE LENGTH ("L") OF NEW PIPE TO BE RESTRAINED IS THE LENGTH FOR EACH

4. THE ABOVE INFORMATION WAS PROVIDED USING THE THRUST RESTRAINT PROGRAM

ISSUED BY THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA) AND IS BASED

ON THE ASSUMPTIONS LISTED IN NOTE 1. RESTRAINED LENGTH REQUIREMENTS FOR

FIELD CONDITIONS AND PIPE SIZES DIFFERING FROM THOSE LISTED ABOVE SHOULD

RESTRAINED LENGTH SHOWN IS FOR THE BRANCH. THE VALUE OF THE RESTRAINED

JOINT RESTRAINT SCHEDULE AND NOTES

LENGTH ASSUMES THAT THE SIZE OF THE BRANCH IS EQUAL TO OR LESS THAN

THE RUN. THE VALUE OF THE Lr=USED IN THE TABLE IS 10 FEET. (Lr= TOTAL

LENGTH BETWEEN FIRST JOINTS ON EITHER SIDE OF THE TEE ON THE RUN.)

5. RESTRAINED JOINT PIPE AND FITTINGS SHALL BE USED ONLY AS ALLOWED BY THE

PROJECT PLANS AND/OR SPECIFICATION. (IF THRUST BLOCKS ARE USED SEE

6. TEE FITTINGS: PIPE SIZE SHOWN FOR THE TEE IS THE SIZE OF THE RUN. THE

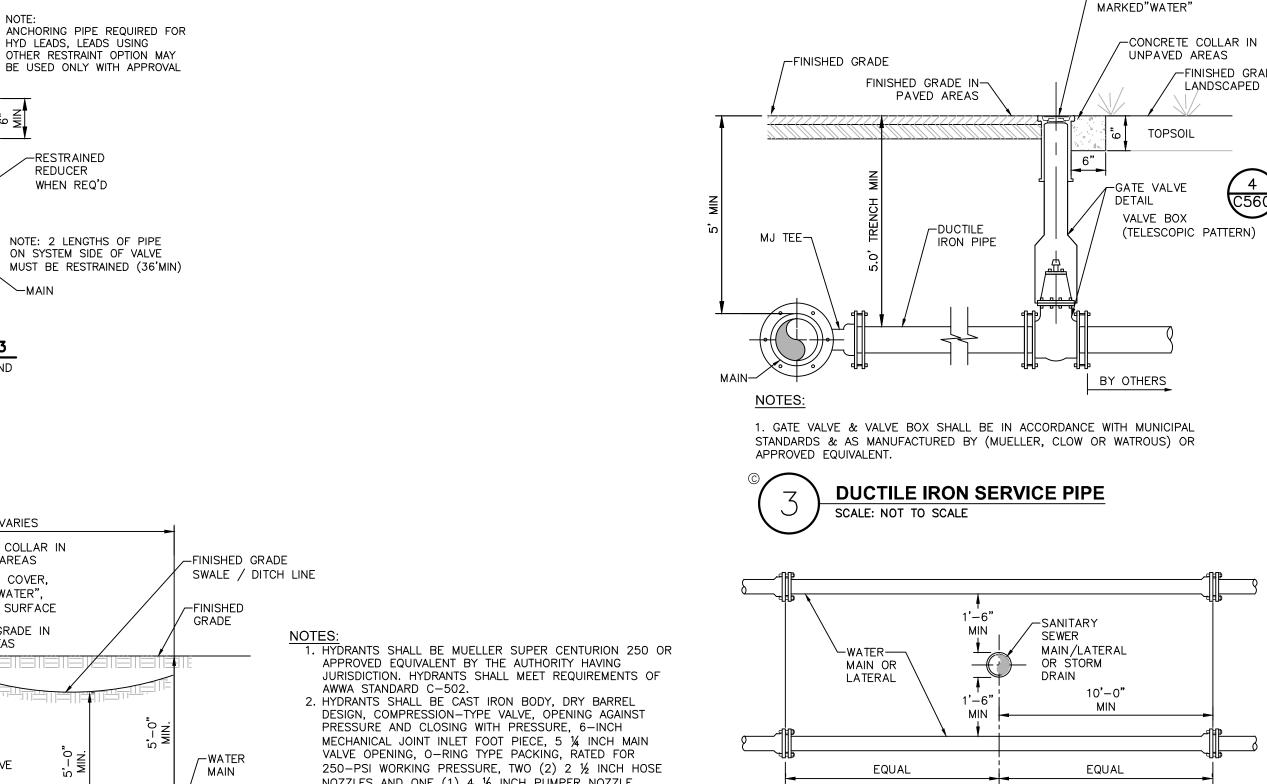
CLAYS, SANDY CLAYS, SILTY CLAYS. LEAN CLAYS

C. PIPE TABLE CALCULATION IS BASED ON PVC OR POLYWRAPPED DIP

241 100 48 24 202 206 206 72

10" 86 36 17 9 68 71

ASSUMPTIONS:



MANUFACTURE

RESTRAINED JOINT

SCALE: NOT TO SCALE

3/4 "RODS

14(8)²

RESTRAINT-

36 | 18(12) ²

1. APPLIES TO 5/8"

2. MIN NO. OF 1" RODS.

RODS AS WELL.

NO. OF TIE RODS REQUIRED

INCHES

16

RECOMMENDATIONS

-MJ RETAINER GLAND

CLOW F-1058, OR

APPROVED EQUAL

THRUST RESTRAINT DETAIL

RESTRAINED END CAI

RETAINER CLAMPS

ALTERNATE STYLE

HIGH-STRENGTH CORTEN

(HYD END)

ANCHORING PIPE

JOINT RESTRAINT OPTIONS

AS MANUFACTURED BY STAR

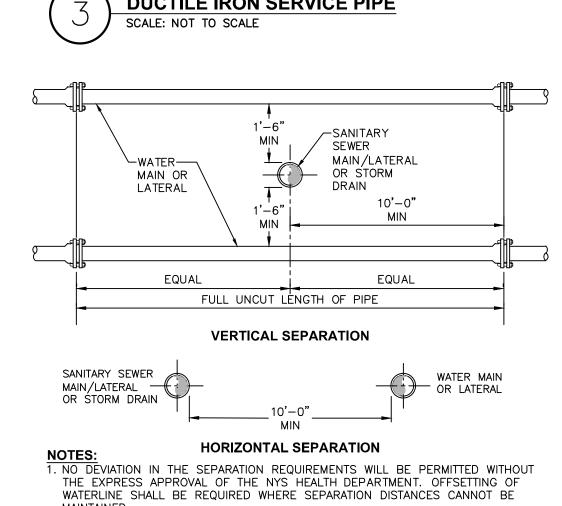
SUPPLY CORP OR APP EQUAL

ROTO-RING GLAND

CLOW F-1216 OR

APPROVED EQUAL

E RODS-



2. WHEN IT IS IMPOSSIBLE TO OBTAIN VERTICAL SEPARATION AS INDICATED ABOVE,

PRESSURE PIPE FOR 10' EACH SIDE OF CROSSING AND SHALL BE PRESSURE

SANITARY/STORM SEWER AND

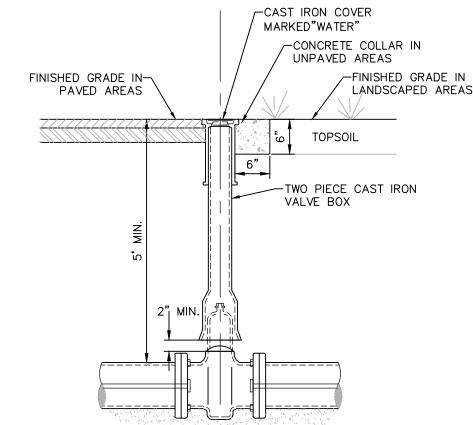
WATERMAIN SEPARATION DETAIL

BOTH THE WATER MAIN AND THE SEWER MAIN SHALL BE CONSTRUCTED OF

MECHANICAL JOINT, DUCTILE IRON PIPE OR PVC WATER WORKS GRADE

TESTED TO 150psi TO ASSURE WATER TIGHTNESS.

SCALE: NOT TO SCALE



1. NON-RISING STEM GATE VALVE, OPERATING DIRECTION SHALL BE COUNTERCLOCKWISE TO OPEN. 2. MINIMUM DISTANCE TO JOINTS, FITTINGS, OR OTHER WET TAPS OR STOPS 3. IF VALVE IS TO BE RODDED, PROVIDE VALVE WITH RODDING FLANGES OR EYEBOLTS. TWO (2) 3/4" GALVANIZED STEEL RODS WITH MALLEABLE IRON NUTS AT 180° SPACING SHALL BE USED FOR RODDING VALVES. FOR 12" DIA. PIPE OR LESS. FOR LARGER PIPE SIZES, SEE TABLE FOR NUMBER OF TIE RODS REQUIRED—"JOINT RESTRAINT OPTION DETAILS.) 4. GATE VALVE & VALVE BOX SHALL BE IN ACCORDANCE WITH MUNICIPAL STANDARDS & AS MANUFACTURED BY (MUELLER, CLOW OR WATROUS) OR

TYPICAL GATE VALVE DETAIL

APPROVED EQUIVALENT.

POTABLE WATER NOTES

FINISHED GRADE IN

LANDSCAPED AREAS

- 1. THE CONTRACTOR SHALL CONTACT THE CITY OF BEACON WATER DEPARTMENT 48 HOURS BEFORE STARTING WORK AS WELL AS 48 HOURS PRIOR TO CONNECTIONS TO THE CITY WATER SYSTEM.
- 2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY EXISTING WATER CONNECTION AND ALL PROPOSED UTILITY CROSSINGS AND IF NECESSARY EXCAVATE TEST PITS TO DETERMINE DEPTH AND CONDITION OF EXISTING UTILITIES. 3. THE CONTRACTOR SHALL EXPOSE THE EXISTING WATER MAIN AT THE CONNECTION POINT FOR WATER DEPARTMENT INSPECTION. THE CONTRACTOR SHALL UTILIZE A RESTRAINED JOINT METHOD AS APPROVED BY
- 4. ALL WATER LINES SHALL BE DUCTILE IRON PIPE, CLASS 52 TYTON PUSH ON GASKETED JOINT BY U.S. PIPE OR EQUAL; UNLESS OTHERWISE SPECIFIED BY OR APPROVED BY THE WATER DEPARTMENT. RESTRAINED JOINTING SHALL EMPLOY "MEGALUG" CONNECTIONS, LOCK-JOINT PIPE, OR AS ALTERNATIVELY SPECIFIED BY THE WATER DEPARTMENT AND ACCORDING TO THE RESTRAINT SCHEDULE HEREIN. ALL WATER PIPING CONSTRUCTION SHALL BE TO THE SPECIFICATIONS OF THE WATER DEPARTMENT.
- 5. THE WATER LINE MAY BE FLEXED WITHIN PIPE SPECIFICATIONS OR LAID DEEPER IN AREAS WHERE CROSSINGS WITH THE SANITARY LINE OCCUR, TO ACHIEVE THE REQUIRED 1.5' VERTICAL SEPARATION DISTANCE. IF THIS DISTANCE CANNOT BE REASONABLY ACHIEVED. THE CONTRACTOR SHALL CUT AND JOINT THE PIPE LINES 10' IN EACH DIRECTION. (SEE WATERLINE OFFSET DETAIL FOR FURTHER
- 6. ALL NEW WATER MAIN INSTALLATIONS SHALL BE HYDROSTATICALLY TESTED PER AWWA STANDARD O 600(LATEST REVISION) AT A PRESSURE OF 150 PSI, OR 1.25 TIMES THE WORKING PRESSURE OF THE SYSTEM AS A MINIMUM. ALLOWABLE LEAKAGE OF THIS TEST SHALL BE AS DEFINED IN SECTION 5.2 OF
- '. APPROVED AND TESTED WATER MAIN SHALL BE DISINFECTED PER AWWA SECTION C651, AS DIRECTED BY
- THE WATER DEPARTMENT AND ENGINEER. THE TABLET METHOD FOR DISINFECTION SHALL NOT BE 8. THE FACILITY WILL BE CONSTRUCTED WITH WATER CONSERVING PLUMBING FIXTURES.
- 9. THE WATERMAIN IS TO BE INSTALLED AT A CONTINUOUS GRADE WITH NO ABRUPT HIGH OR LOW POINTS.
- 10. RELOCATE HYDRANT, WATER VALVES, AND PIPING AS REQUIRED BY FINAL FIELD CONDITIONS AND AS APPROVED BY THE WATER DEPARTMENT. POTENTIAL CONFLICTS WITH PROPOSED DRAINAGE IMPROVEMENTS OR OTHER UTILITIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
- 11. ALL POTABLE WATERMAIN PIPES SHALL BE 8" DIAMETER-CLASS 52 DUCTILE IRON PIPE. ALL 4" DIAMETER WATER SERVICE LINES SHALL BE - CLASS 52 DUCTILE IRON AND ALL 2" DIAMETER WATER SERVICE LINES SHALL BE TYPE K COPPER, UNLESS OTHERWISE NOTED. SERVICE MAIN CONNECTION SIZE SHALL BE AS
- 12. REGULATORY AGENCY SHALL BE DEFINED, UNLESS OTHERWISE INDICATED, AS THE CITY OF BEACON WATER DEPARTMENT, THE DUTCHESS COUNTY DEPARTMENT OF HEALTH (DCDOH), AND CITY ENGINEER.
- 13. POTABLE WATER LINES IN BUILDING SHALL BE PROTECTED FROM FIRE SERVICE LINES WITH APPROPRIATE BACKFLOW PREVENTION PER DOH, NFPA, OR OTHER APPLICABLE CODE AND SHALL BE APPROVED SEPARATELY FROM THESE PLANS.

DUTCHESS COUNTY STANDARD NOTES FOR WATER SYSTEMS:

- THE DESIGN, CONSTRUCTION AND INSTALLATION SHALL BE IN ACCORDANCE WITH THIS PLAN AND GENERALLY ACCEPTED STANDARDS IN EFFECT AT THE TIME OF CONSTRUCTION WHICH INCLUDE: "NEW YORK STATE DESIGN STANDARDS FOR INTERMEDIATE SIZED WASTEWATER TREATMENT SYSTEMS", NYSDEC
- "RECOMMENDED STANDARDS FOR SEWAGE TREATMENT WORKS, (TEN STATES)." "RECOMMENDED STANDARDS FOR WATER WORKS, (TEN STATES)."
- NEW YORK STATE DEPARTMENT OF HEATH AND DUTCHESS COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION POLICIES, PROCEDURES AND STANDARDS."
- "DUTCHESS COUNTY AND NEW YORK STATE SANITARY CODES." "DUTCHESS COUNTY ENVIRONMENTAL HEALTH SERVICES DIVISION CERTIFICATE OF APPROVAL LETTER."
- THIS PLAN IS APPROVED AS MEETING THE APPROPRIATE AND APPLIED TECHNICAL STANDARDS, GUIDELINES, POLICIES AND PROCEDURES FOR ARRANGEMENT OF SEWAGE DISPOSAL AND WATER SUPPLY FACILITIES. UPON COMPLETION OF THE FACILITIES, THE FINISHED WORKS SHALL BE INSPECTED, TESTED, AND CERTIFIED COMPLETE TO THE DC EHSD BY THE NEW YORK STATE LICENSED PROFESSIONAL ENGINEER SUPERVISING CONSTRUCTION. NO PART OF THE FACILITIES SHALL BE PLACED INTO SERVICE UNTIL ACCEPTED BY THE DC EHSD. APPROVAL OF ANY PLAN(S) OR AMENDMENT THERETO SHALL BE VALID FOR A PERIOD OF FIVE (5) YEARS FROM THE DATE OF APPROVAL. FOLLOWING THE EXPIRATION OF SAID APPROVAL, THE PLAN(S) SHALL BE RE-SUBMITTED TO THE COMMISSIONER OF HEALTH FOR CONSIDERATION FOR RE-APPROVAL, RE-SUBMISSION OR REVISED SUBMISSION OF PLANS AND/OR ASSOCIATED DOCUMENTS SHALL BE SUBJECT TO COMPLIANCE WITH THE

TECHNICAL STANDARDS, GUIDELINES, POLICIES AND PROCEDURES IN EFFECT AT THE TIME OF THE RE-SUBMISSION. NO CELLAR, FOOTING, FLOOR, GARAGE, COOLER OR ROOF DRAINS SHALL BE DISCHARGED INTO THE SEWAGE ALL BUILDINGS SHALL BE CONSTRUCTED AT AN ELEVATION HIGH ENOUGH TO ENSURE GRAVITY FLOW TO THE SEWAGE COLLECTION SYSTEM. ALL REQUIRED EROSION & SEDIMENT CONTROL AND STORMWATER POLLUTION PREVENTION WATER QUALITY & QUANTITY CONTROL STRUCTURES, PERMANENT AND TEMPORARY, ARE SHOWN ON THE PLANS. THE DC EHSD SHALL BE NOTIFIED SIXTY DAYS PRIOR TO ANY CHANGE IN USE; USE CHANGES MAY REQUIRE

NO BUILDINGS ARE TO BE OCCUPIED AND THE NEW WATER SYSTEM SHALL NOT BE PLACED INTO SERVICE, UNTIL A "COMPLETED WORKS APPROVAL" IS USED UNDER SECTION 5-1.22(D) OF PART 5 OF THE NEW YORK STATE

NO BUILDINGS ARE TO BE OCCUPIED AND THE NEW WASTEWATER COLLECTION SYSTEM SHALL NOT BE PLACED INTO SERVICE UNTIL, A "CERTIFICATE OF CONSTRUCTION COMPLIANCE" IS ISSUED UNDER SECTION 19.7 OF ARTICLE 19 OF THE DUTCHESS COUNTY SANITARY CODE ALL SERVICE LINES ARE THE RESPONSIBILITY OF THE OWNER UP TO THE PROPERTY LINE. THE WATER AND SEWER COMPANIES SHALL BE RESPONSIBLE FOR ALL VALVES AND PIPES WHICH ARE NOT ON THE OWNER'S PROPERTY. THE UNDERSIGNED OWNERS OF THE PROPERTY HEREON STATE THAT THEY ARE FAMILIAR WITH THIS MAP, ITS CONTENTS AND ITS LEGENDS AND HEREBY CONSENT TO ALL SAID TERMS AND CONDITIONS STATES HEREON.

WATER MAIN DISINFECTION NOTES

- 1. APPROVED AND TESTED WATER MAIN SHALL BE DISINFECTED PER A.W.W.A. SECTION C651. 2. THE CONTRACTOR SHALL NOTIFY THE CITY OF BEACON WATER DEPARTMENT AND THE PROJECT ENGINEER 48 HOURS PRIOR TO DISINFECTING THE SERVICE LINES. 3. DISINFECTED WATER MUST REMAIN IN THE MAINS FOR A MINIMUM OF 24 HOURS BEFORE BEING
- 4. WATER SERVICE LINES SHALL BE DISINFECTED AS PER AWWA SECTION C651 WHERE: A. CHLORINE CONCENTRATION IN WATER LINES SHALL BE NO LESS THAN 50 MG/L AT START OF 24-HOUR TEST.

B. CHLORINE RESIDUAL SHALL BE NO LESS THAN 10 MG/L AT END OF TEST.

- 5. PRIOR TO RECEIVING CERTIFICATE OF OCCUPANCY, A TOTAL OF TWO (2) SETS OF MICRO BIOLOGICAL SAMPLES SHALL BE COLLECTED. EACH SET SHALL BE FROM BOTH ENDS AND THE MIDDLE OF THE NEW DISTRIBUTION SYSTEM. SAMPLING OF SETS SHALL BE 24 HOURS APART. ALL LINES SHALL NOT BE USED UNTIL ALL MICRO BIOLOGICAL SAMPLES ARE ACCEPTED BY THE DUTCHESS COUNTY HEALTH DEPARTMENT. RESULTS OF ALL MICRO BIOLOGICAL TESTING SHALL BE SUBMITTED TO THE DUTCHESS COUNTY HEALTH DEPARTMENT ALONG WITH ENGINEERS CERTIFICATE OF COMPLETION.
- ADDITIONAL NOTES FOR RESIDENTIAL WITH CENTRAL UTILITIES 1. THAT, NO BUILDINGS ARE TO BE OCCUPIED AND THE NEW WATER SYSTEM SHALL NOT BE PLACED INTO SERVICE, UNTIL A "COMPLETED WORKS APPROVAL" IS ISSUED UNDER SECTION 5-1.22(d) OF PART 5 OF THE NEW YORK SANITARY CODE (10NYCRR5) 2. THAT, NO BUILDINGS ARE TO BE OCCUPIED AND THE NEW WASTEWATER COLLECTION SYSTEM SHALL

UNDER SECTION 19.7 OF ARTICLE 19 OF THE DUTCHESS COUNTY SANITARY CODE.

NOT BE PLACED INTO SERVICE UNTIL, A "CERTIFICATE OF CONSTRUCTION COMPLIANCE" IS ISSUED

AND ALL PIPE TAPS REQUIRED FOR TESTING AS SPECIFIED.

WATER MAIN PRESSURE TESTING NOTES

AND THE PROJECT ENGINEER 48 HOURS PRIOR TO TESTING THE SERVICE LINES. 2. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR ANY

1. THE CONTRACTOR SHALL NOTIFY THE CITY OF BEACON WATER DEPARTMENT, THE CITY ENGINEER

- 3. ALL NEW WATER MAIN INSTALLATIONS SHALL BE HYDROSTATICALLY TESTED PER A.W.W.A. STANDARD C600 (LATEST REVISION) AT A PRESSURE OF 150 PSI, OR 1.25 TIMES THE WORKING PRESSURE OF THE SYSTEM AS A MINIMUM. ALLOWABLE LEAKAGE OF THIS TEST SHALL BE AS DEFINED IN SECTION 5.2 OF REFERENCED A.W.W.A. SPECIFICATION.
- L = ALLOWABLE LEAKAGE, (GPH)ALLOWABLE LEAKAGE FOR WATER MAIN $L = \frac{SD\sqrt{P}}{148,000} S = LENGTH OF PIPE TESTED (FEET)$ D = NOMINAL DIAMETER (INCHES) P = AVERAGE TEST PRESSURE (150 PSI)

4. PRIOR TO RECEIVING CERTIFICATE OF OCCUPANCY, RESULTS OF ALL LEAKAGE TESTING SHALL BE SUBMITTED TO THE DUTCHESS COUNTY HEALTH DEPARTMENT ALONG WITH ENGINEERS CERTIFICATE OF

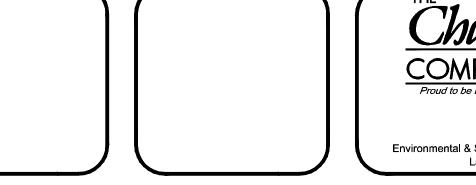
248 TIORONDA AVE., BEACON, N.Y

WATER SYSTEM DETAILS & NOTES

CITY OF BEACON, DUTCHESS COUNTY, NEW YORK

designed | checked |09/10/18| 1" = 30¹ project no. 81750.00 heet no. C560 15 of 17

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01/28/20 | REVISED PER PLANNING BOARD COMMENTS 12/20/19 REVISED PER PLANNING BOARD COMMENTS

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9. IN MUCK, PEAT, OR RECENTLY PLACED FILL, ALL THRUSTS SHALL BE

OF SUCH UNSTABLE MATERIAL AND REPLACEMENT WITH BALLAST OF

10.CONCRETE THRUST BLOCK SHALL BE USED ONLY AS ALLOWED BY THE

USED SEE SCHEDULE OF JOINT RESTRAINED PIPE.)

SCALE: NOT TO SCALE

Call Before You Dig

RESISTED BY PILES OR TIE RODS TO SOLID FOUNDATIONS, OR BY REMOVAL

SUFFICIENT STABILITY TO RESIST THE THRUSTS; ALL AS REQUIRED BY THE

PROJECT PLANS AND/OR SPECIFICATION. (IF RESTRAINED JOINT PIPE IS TO BE

CONCRETE THRUST BLOCK DETAILS