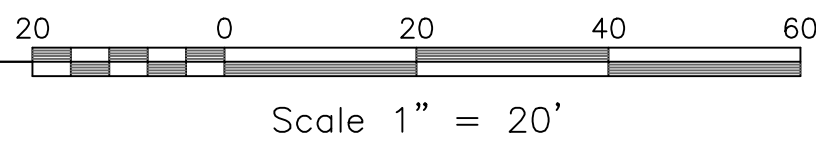


1/CD-5.0  
UTILITY PLAN  
SCALE: 1"=20'



WATER,SANITARY SEWER & STORM SEWER SEPARATION

1. HORIZONTAL AND VERTICAL SEPARATION

A. SANITARY SEWERS SHALL BE LAID AT LEAST 10-FOOT HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IN CASES WHERE IT IS NOT PRACTICAL TO MAINTAIN A 10-FOOT SEPARATION, THE CITY OF DURHAM MAY ALLOW DEVIATION ON A CASE-BY-CASE BASIS, IF SUPPORTED BY DATA FROM THE DESIGN ENGINEER. SUCH DEVIATION ON MAY ALLOW THE INSTALLATION OF THE SANITARY SEWER CLOSER TO A WATER MAIN, PROVIDED THAT THE WATER MAIN IS IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SANITARY SEWER AND AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18-INCHES ABOVE THE TOP OF THE SEWER.

B. IF IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS DESCRIBED ABOVE OR ANYTIME THE SANITARY SEWER IS OVER THE WATER MAIN, BOTH THE WATER MAIN AND SANITARY SEWER MUST BE CONSTRUCTED OF FERROUS PIPE, COMPLYING WITH THE PUBLIC WATER SUPPLY DESIGN STANDARDS AND BE PRESSURE TESTED TO 150-PSI TO ASSURE WATER TIGHTNESS BEFORE BACKFILLING.

C. A 24-INCH VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER LINES OR FERROUS PIPE SPECIFIED. A 12-INCH VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND WATER MAINS. IF A 12-INCH VERTICAL SEPARATION IS NOT MAINTAINED AT A CROSSING BETWEEN STORM SEWER AND WATER MAINS (OR PRESSURE SEWERS), THE WATER MAIN SHALL BE CONSTRUCTED OF FERROUS PIPE AND A CONCRETE COLLAR SHALL BE POURED AROUND WATER MAINS AND STORM SEWER TO IMMOBILIZE THE CROSSING.

2. CROSSINGS

A. SANITARY SEWER CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18-INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SANITARY SEWER. THE CROSSING SHALL BE ARRANGED SO THAT THE SANITARY SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

B. WHEN IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS STIPULATED ABOVE, ONE OF THE FOLLOWING METHODS MUST BE SPECIFIED.

1. THE SANITARY SEWER SHALL BE DESIGNED AND CONSTRUCTED OF FERROUS PIPE AND SHALL BE PRESSURE TESTED AT 150-PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING, OR
2. EITHER THE WATER MAIN OR THE SANITARY SEWER LINE MAY BE ENCASED IN A WATERTIGHT CARRIER PIPE, WHICH EXTENDS 10-FEET ON BOTH SIDES OF THE CROSSING, MEASURED PERPENDICULAR TO THE WATER MAIN. THE CARRIER PIPE SHALL BE OF MATERIALS APPROVED BY THE CITY OF DURHAM FOR USE IN WATER MAIN CONSTRUCTION.

WATER:

1. MAINTAIN A MINIMUM COVER OF 36" AND MAXIMUM COVER OF 42" BELOW FINISHED GRADE OVER ALL PIPES UNLESS OTHERWISE DIRECTED OR SHOWN ON THE PLANS. DUE TO THE HEIGHTS OF VALVES, INCREASE THE COVER DEPTHS ADJACENT TO THE VALVES OR VARIED AT POINTS OF TIE-IN TO EXISTING LINES.

2. BACKFLOW PREVENTERS ARE REQUIRED ON THIS PROJECT. BACKFLOW PREVENTER INSTALLER MUST OBTAIN A BACKFLOW PREVENTER PERMIT (ONLINE) PRIOR TO BEGINNING BACKFLOW PREVENTER INSTALLATIONS. CONTACT THE CROSS-CONNECTION CONTROL OFFICE AT 919-560-4194 TO OBTAIN ADDITIONAL INFORMATION AND INSTALLATION REQUIREMENTS.

3. A WATER PERMIT IS REQUIRED FOR THIS PROJECT.

2/CD-5.0  
UTILITY SEPARATION NOTES  
SCALE: NTS

UTILITY NOTES:

1. ALL WORK TO BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR WATER DISTRIBUTION AND WASTEWATER COLLECTION SYSTEMS OF THE CITY OF DURHAM STANDARDS AND POLICIES. INSTALLATION, TESTING, AND CERTIFICATION OF BACKFLOW DEVICES SHALL BE IN ACCORDANCE WITH THE DURHAM CROSS CONNECTION CONTROL ORDINANCE AND MANUAL.
2. CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO MOBILIZATION. REPORT THE RESULTS TO THE ENGINEER OF RECORD. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR WORK THAT MUST BE REDONE IF CONFLICTS ARE NOT REPORTED TO THE ENGINEER PRIOR TO BEGINNING INSTALLATION.
3. ALL UTILITY WORK SHALL CONFORM TO APPLICABLE CITY AND STATE CODES.
4. 6" SANITARY SEWER WILL BE INSTALLED AT A MINIMUM SLOPE OF 1.0%. 4" SANITARY SEWER WILL BE INSTALLED AT A MINIMUM SLOPE OF 2.0%.
5. CLEANOUTS ON A 4" SANITARY SEWER LATERAL WILL BE INSTALLED AT A MAXIMUM OF 50 FEET APART. CLEANOUTS ON A 6" SANITARY SEWER LATERAL WILL BE INSTALLED AT A MAXIMUM OF 75 FEET APART.
6. ALL CLEANOUTS LOCATED IN PAVEMENT AND/OR VEHICULAR USE AREAS WILL BE TRAFFIC BEARING AND WILL WITHSTAND A H-20 LOADING. THESE CLEANOUTS ARE DESIGNATED (TBCO) TRAFFIC BEARING CLEAN OUT ON THE PLANS. ALL CLEANOUTS WITHIN THE FLOODPLAIN SHALL BE WATERTIGHT.
7. ALL WATER AND SEWER LINES ARE TO BE PRIVATE UNLESS OTHERWISE NOTED.
8. ALL WATER LINES SHALL HAVE A MINIMUM OF 36" COVER.
9. PVC SANITARY SEWER SHALL HAVE A MINIMUM COVER OF 5 FEET IN STREETS AND 4 FEET IN OUTFALLS.
10. POWER, TELEPHONE, AND GAS SERVICES SHALL BE UNDERGROUND. ACCESS AND SERVICE ROUTES TO BE COORDINATED WITH THE PUBLIC UTILITIES AND THE DEVELOPER.
11. BACKFLOW PREVENTERS ARE REQUIRED ON THIS PROJECT. BACKFLOW PREVENTER INSTALLER MUST OBTAIN A BACKFLOW PREVENTER PERMIT PRIOR TO BEGINNING BACKFLOW PREVENTER INSTALLATIONS. CONTACT THE CROSS-CONNECTION CONTROL OFFICE AT 919-560-4194 TO OBTAIN ADDITIONAL INFORMATION AND INSTALLATION REQUIREMENTS.
12. DOMESTIC BACKFLOW - INDICATE TYPE, SIZE, AND LOCATION ON DRAWINGS OF DOMESTIC BACKFLOW; DOUBLE CHECK VALVE ASSEMBLY ASSE #1015 INSTALLED ABOVE GROUND IN AN ASSE #1060 ENCLOSURE OR DIRECTLY INSIDE. WYE STRAINER AND MAIN SHUT-OFF SHALL BE INSTALLED PRIOR TO #1 SHUT OFF OF THE BACKFLOW ASSEMBLY.
13. ALL NEW FIRE HYDRANTS AND FIRE DEPARTMENT CONNECTIONS MUST BE PROVIDED WITH 5 INCH DIAMETER STORZ CONNECTIONS. FIRE DEPARTMENT CONNECTION INLET MUST BE ORIENTED 30 DEGREES TOWARDS GRADE.
14. KEYBOX(ES) REQUIRED AT BUILDING TO ALLOW ACCESS THROUGH GATES AND INTO BUILDING. CONTACT FIRE PREVENTION AT (919) 560-4233 X19246 REGARDING PROCUREMENT OF KEYBOXES.
15. PROVIDE FIRE PLANS EXAMINER ONE COPY OF UTILITY CONSTRUCTION DRAWINGS, SHOWING UNDERGROUND PIPING LAYOUT AND ALL FIRE APPURTENANCES. PERMIT FOR INSTALLATION OF PRIVATE FIRE HYDRANT(S) MUST BE ISSUED BY FIRE PLANS EXAMINER PRIOR TO INSTALLATION OF SAID HYDRANTS.

3/CD-5.0  
UTILITY PLAN NOTES  
SCALE: NTS

TABLE B105.1 MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS					
FIRE-FLOW CALCULATION AREA (square feet)					FLOW DURATION (hours)
Type I-A and I-B*	Type I-A and I-A*	Type IV and V-A*	Type I-B and I-B*	Type V-B*	
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250

FIRE FLOW CALCULATIONS  
TYPE IIB CONSTRUCTION TYPE  
BUILDING AREA = 11,105 SF  
REQUIRED FLOW = 2,250 GPM  
BUILDING IS SPRINKLED SO REQUIRED  
FIRE FLOW = 1,500 GPM

4/CD-5.0  
REQUIRED FIRE FLOW  
SCALE: NTS

0830-07-58-4362  
0830-06-48-8582

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Project

**DURHAM TECH FACILITIES BUILDING**  
DURHAM, NC

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DURHAM, NC 27703  
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PIN:  
0830-07-58-4362  
0830-06-48-8582

CJT Job Number: 1707

Drawn VJC/PBR  
Checked VJC  
Date 07/02/2018  
Revisions

CONSTRUCTION DRAWINGS

NOT RELEASED FOR CONSTRUCTION

Sheet Title

**UTILITY AND LIGHTING PLAN**

Sheet Number

CD-5.0