FIRE PROTECTION NOTES:

1. ALL RODS, NUTS, BOLTS, WASHERS, CLAMPS AND OTHER RESTRAINING DEVICES SHALL BE PROTECTED FROM CORROSION WITH A BITUMINOUS COATING.
2. METHOD OF PIPE RESTRAINT SHALL BE CONCRETE THRUST BLOCKING IN ACCORDANCE WITH DETAILS ON THIS DRAWING.
3. MINIMUM DEPTH OF COVER FOR FIRELINE IS 3.5' MEASURED FROM THE TOP OF PIPE TO FINISHED GRADE.
4. LOW VOLTAGE FIRE ALARM CIRCUITS, 24 VDC, CANNOT BE RUN IN CONDUIT COMMON WITH VAC CIRCUITS EXCEEDING 50 VOLTS.
5. A METAL SIGN SHALL BE PERMANENTLY INSTALLED AND READILY VISIBLE AT THE FIRE DEPARTMENT CONNECTION. THE SIGN SHALL HAVE LETTERS SIX INCHES IN HEIGHT. THE LETTERS SHALL BE OF RED REFLECTIVE MATERIAL ON A WHITE REFLECTIVE BACKGROUND. THE VERBIAGE MAYBE "FDC" OR "FIRE DEPT.CONNECTION" IN ACCORDANCE WITH THE INTERNATIONAL FIRE CODE (2009 EDITION) SECTION 912. WHEN THE FDC PROTECTS MULTIPLE ADDRESSES WITHIN A COMPLEX, BUT NOT ALL OF THE ADDRESS, THE SPECIFIC ADDRESSES BEING PROTECTED SHALL BE SHOWN ON THE FDC SIGN. MINIMUM LETTER SIZE SHALL BE TWO INCHES.
6. NO LANDSCAPING SHALL BE PLACED WITHIN A THREE FOOT RADIUS OF ANY FIRE HYDRANT. FIRE DEPARTMENT CONNECTION FOR FIRE PROTECTION SYSTEMS OR FIRE SUPPRESSION SYSTEM CONTROL VALVE. LANDSCAPING SHALL BE OF A TYPE THAT WILL NOT ENCROACH IN THE THREE FOOT RADIUS AT MATURITY.
7. THREADS FOR FDC AND HYDRANTS SHALL BE CONSISTENT WITH PRINCE GEORGE COUNTY FIRE DEPARTMENT EQUIPMENT.

FIRE FLOW DATA

A FIRE FLOW TEST PERFORMED OCTOBER 2013 ON A HYDRANT NEAR THE INTERSECTION OF OWENS WAY AND BAILEY'S RIDGE DRIVE PROVIDED THE FOLLOWING RESULTS AT A FLOW OF 1,100 GPM:

STATIC PRESSURE = 42 PSI
RESIDUAL PRESSURE = 30 PSI

CONCRETE THRUST BLOCKS, MINIMUM AREA OF BEARING						
Pipe Size	90° Bend		45° Bend		Tees, Plugs, Caps, & Hydrants	
in.	ft²	m²	ft²	m²	ft²	m²
4	2	0.19	2	0.19	2	0.19
6	5	0.46	3	0.28	4	0.37
8	8	0.74	5	0.46	6	0.56
10	13	1.21	7	0.65	9	0.84
12	18	1.67	10	0.93	13	1.21

CONCRETE THRUST BLOCKS, MINIMUM AMOUNT OF CONCRETE	
Size of Fitting	**Cubic Yards**
3"-8"	¾
10"-12"	1 ½

THRUST @ 225 PSI WATER PRESSURE FOR FITTINGS			
Pipe	**90° Bend**	**45° Bend**	**Dead End**
4	2,559	1,385	1,810
6	5,288	2,862	3,739
8	9,097	4,923	6,433
10	13,685	7,406	9,677
12	19,353	10,474	13,685

Water Pressure > 100 psi MULTIPLY Table by Ratio of Pressure …150 psi/100 psi = 1.5 Factor
2007 NFPA 24

Minimum Thrust Block Size

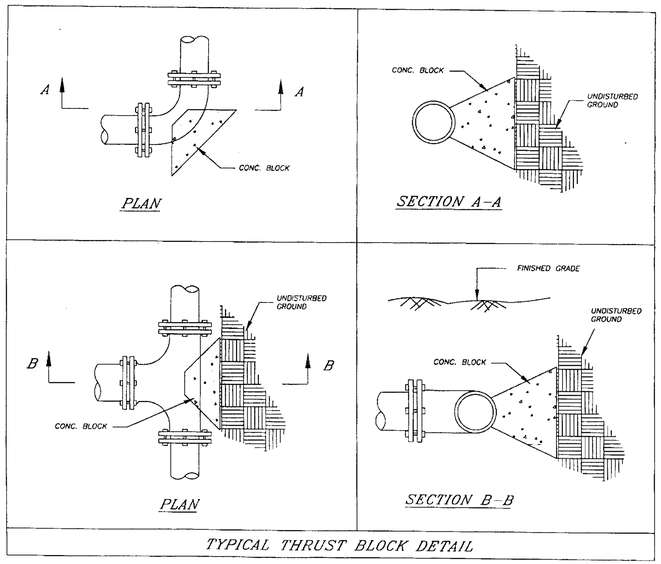
$A_b = (h)(b) = T (S_f)/ S_b$

(h) = block height, (b) = block width
T = thrust force table,
S_f = safety factor (1.5)
S_b = soil bearing from table

SOIL	**BEARING lb/ft²**
SOFT CLAY	1,000
SAND	4,000
SAND CLAY	6,000
HARD CLAY	9,000

ROD NUMBER – DIAMETER COMBINATIONS				
Pipe Size	**5/8 in.**	**3/4 in.**	**7/8 in.**	**1 in.**
4	2	----	----	----
6	2	----	----	----
8	3	2	----	----
10	4	3	2	----
12	6	4	3	2

Table derived using pressure of 225 psi (15.5 bars) and design stress of 25,000. 2007 NFPA 24 Table 10.8.3.1.2.2



TYPICAL THRUST BLOCK DETAIL

Fire Flow Estimate Form

International Fire Code Method of Calculating NFF (Needed Fire Flow)

Engineer: Timmons Group Date: 3/28/14

Project Name and Address: Jefferson Park Office Complex Calc By: BSM

Type of Construction – Based on 2000 Edition of the International Building Code: Type III B

Number of Stories: two

Total Ground Floor Area – Including Projections (Canopies. Loading Docks, Etc): 10,430

Total Area of Other Floors – Including Basements: 10,890

Total Building Area in Square Feet: 21,320

FIRE AREA CONSIDERED:

Note: In order to apply the reduction in area for a building, a fire resistive rated FIRE WALL without openings shall be provided. WITHOUT OPENINGS refers to no penetrations being permitted (i.e. – doors, duct penetrations, pipe penetrations. (B104.1)

Fire Resistive Rating of **FIRE WALL** _____ (Hours)

Area In Square Feet Between **FIRE WALL** or Either Side _____

Required Fire Flow from International Fire Code – Table B105.1 5,000

Fire Flow Duration in Hours from International Fire Code – Table B105.1 _____

NEEDED FIRE FLOW : (Based on Total Adjusted Square Foot Area)

Automatic Sprinklers (YES ___ NO ✓) Reduction Factor (75% max) ____ % x (NFF)_____ = _____**GPM**

NOTE: MINIMUM REQUIRED FIRE FLOW NOT LESS THAN 1500 GPM AT MINIMUM 20 PSI RESIDUAL PRESSURE

TOTAL GPM: 5,000

FIRE HYDRANTS AND SPACING:

REQUIRED MINIMUM NUMBER OF FIRE HYDRANTS (IFC Table C105.1) 3

AVERAGE SPACING BETWEEN FIRE HYDRANTS (IFC Table C105.1) 400

I CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT.

SIGNATURE: _____ *P.E.*

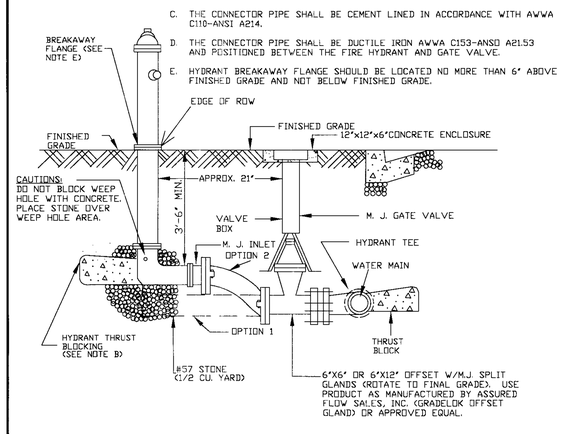
(SIGNATURE REQUIRED)

Reference: 2000 Edition International Fire Code, Appendix B, C, and D

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES

OPTION 1: IF GRADE ADJUSTMENT IS NOT REQUIRED:
A. CONNECTOR PIPE MAY BE APPROVED D.I. OR P.V.C. PIPE.
B. ALL JOINTS FROM HYDRANT TEE TO HYDRANT ARE TO BE RESTRAINED WITH APPROVED JOINT RESTRAINT DEVICES AND THRUST BLOCKING BEHIND THE HYDRANT

OPTION 2: IF GRADE ADJUSTMENT IS REQUIRED:
A. THE CONNECTOR PIPE SHALL BE OF THE OFFSET DESIGN SO THAT THE FIRE HYDRANT CAN BE ADJUSTED TO ENSURE PLACEMENT AT THE PROPER GRADE. WHEN THE CONNECTOR PIPE IS THE OFFSET DESIGN IT SHALL HAVE AN ANCHORING FEATURE AT BOTH ENDS SO THAT WHEN USED WITH M.J. SPLIT GLANDS A RESTRAINED JOINT IS PROVIDED.
B. ALL JOINTS FROM HYDRANT TEE TO HYDRANT ARE TO BE RESTRAINED WITH APPROVED JOINT RESTRAINT DEVICES AND THRUST BLOCKING BEHIND THE HYDRANT
C. THE CONNECTOR PIPE SHALL BE CEMENT LINED IN ACCORDANCE WITH AWWA C110-ANSI A21.4.
D. THE CONNECTOR PIPE SHALL BE DUCTILE IRON AWWA C153-ANSI A21.53 AND POSITIONED BETWEEN THE FIRE HYDRANT AND GATE VALVE.
E. HYDRANT BREAKAWAY FLANGE SHOULD BE LOCATED NO MORE THAN 6" ABOVE FINISHED GRADE AND NOT BELOW FINISHED GRADE.



NOTE:

(A). HYDRANT ISOLATION VALVE TO BE LOCATED AS CLOSE TO THE HYDRANT AS POSSIBLE
(B) MINIMUM COVER AT DITCH MUST BE 3'6" OR GREATER.

DATE JAN. 2008	TYPICAL FIRE HYDRANT DETAIL	DRWG. NO. FIR-2
REVISIONS		

COMMONWEALTH OF VIRGINIA
BENJAMIN S. MCMILLAN
Lic. No. 048542
4/1/14
PROFESSIONAL ENGINEER

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
2-21-14	COUNTY REVIEW COMMENTS
4-1-14	COUNTY REVIEW COMMENTS

DATE: 9 DEC 2013
DRAWN BY: M. ANDERSON
DESIGNED BY: B. MCMILLAN
CHECKED BY: K. HALPAUS
SCALE: NONE

TIMMONS GROUP

JEFFERSON PARK OFFICE COMPLEX
BLAND DISTRICT - PRINCE GEORGE COUNTY - VIRGINIA
FIRE PROTECTION NOTES AND DETAILS

JOB NO. 34597
SHEET NO. C1.01