DFD PUMP CHART - OFFENSIVE OPERATIONS

1-3/4" HOSE (*2018 AND NEWER - 25 psi/100') (**2017 AND OLDER - 35 psi/100')			
TIP SIZE	**GPM**	**NP**	**FL/100'**
15/16"	185	50	(*25) (**35)
COMBINATION FOG	175	50	(*25) (**35)
COMBINATION FOG	185	75	(*25) (**35)
1-1/2" BRESNAN	100	100	15

2" GREEN HOSE			
TIP SIZE	**GPM**	**NP**	**FL/100'**
1"	210	50	30

2-1/2" HOSE			
TIP SIZE	**GPM**	**NP**	**FL/100'**
1-1/8"	265	50	10
1-3/16"	300	50	15
1-1/4"	325	50	20
COMBINATION FOG	250	50 or 75	10
COMBINATION FOG	300	75	15
2-1/2" BRESNAN	300	100	15

RAM OR BLITZFIRE WITH 1-3/8" TIP			
2-1/2" HOSE	500	80	40
3" HOSE	500	80	25

APPLIANCES	
SIAMESE / WYE = 5 psi	STANDPIPE = 25 psi

ELEVATION	
PER FOOT = 0.5 psi	PER FLOOR = 5 psi

RESIDUAL WATER
0 - 10% STATIC TO RESIDUAL DROP = ADD **3** TIMES CURRENT GPM OUTPUT
11 - 15% STATIC TO RESIDUAL DROP = ADD **2** TIMES CURRENT GPM OUTPUT
16 - 20% STATIC TO RESIDUAL DROP = ADD **1** TIME CURRENT GPM OUTPUT

DFD PUMP CHART - DEFENSIVE OPERATIONS

MASTER STREAMS

TIP SIZE	1 TIP GPM (2 TIP GPM)	FL/100' MULTIPLE LINES (TRUCK OR TOWERS WITH 1 TIP) (TOWERS WITH 2 TIPS)				
	NP = 80 psi	ONE - 3"	TWO - 3"	THREE - 3"	FOUR - 3"	ONE - 5"
1-3/8"	500 (1000)	25 (100)	6 (25)	3 (12)	2 (8)	2 (8)
1-1/2"	600 (1200)	40 (160)	10 (40)	5 (20)	3 (12)	3 (12)
1-3/4"	800 (1600)	60 (240)	15 (60)	8 (32)	5 (20)	5 (20)
2"	1000 (2000)	100 (400)	25 (100)	13 (50)	8 (32)	8 (32)
FOG	500 (1000)	25 (100)	6 (25)	3 (12)	2 (8)	2 (8)
FOG	1000 (2000)	100 (400)	25 (100)	13 (50)	8 (32)	8 (32)

APPLIANCES

SIAMESE / WYE = 5 psi	DECK GUN / GROUND MONITOR = 25 psi
SPRINKLER SYSTEMS = 150 psi	TRUCKS OR TOWERS AT TAILBOARD = 200 psi

RESIDUAL WATER

0 - 10% STATIC TO RESIDUAL DROP = ADD **3** TIMES CURRENT GPM OUTPUT

11 - 15% STATIC TO RESIDUAL DROP = ADD **2** TIMES CURRENT GPM OUTPUT

16 - 20% STATIC TO RESIDUAL DROP = ADD **1** TIME CURRENT GPM OUTPUT

MISCELLANEOUS

HIGH RISE: ENGINE AT THE FDC SHALL PUMP IN "PRESSURE" AND IN "PSI" MODE

RELAY PUMPING: SUPPLY ENGINES PUMP IN "VOLUME" AND IN "RPM" MODE, ATTACK ENGINES SHALL BE IN "PSI" MODE; MAINTAIN 20-80 psi INTAKE PRESSURE

SPRINKLER SYSTEMS: PUMP IN "VOLUME"

WHEN FLOWING MORE THAN 1000 GPM: PUMP IN "VOLUME"

WATER SUPPLY – THREE HYDRAULIC CONCEPTS

CONCEPT 1

Rule of 4's:
When you double the flow, you quadruple the friction loss; when you halve the flow, you quarter the friction loss (**NOTE:** Only for lines of equal length, size, and flow).

Multiple Line Conversions:
2 lines equals ¼ of 1 line
3 lines equals ½ of 2 lines
4 lines equals ⅓ of 2 lines

CONCEPT 2

Maximum Length for Supply Lines:
Utilize the **Rule of 4's Concept** to calculate the maximum lengths of lines given the following:

Theoretical Max Length of Supply Hose:
2-½" hose flowing 500 GPM is 350'
3" hose flowing 500 GPM is 900'

Application Supplying Master Streams
Using 3 lines to pump into a Truck (1000 GPM); max distance is 800' (due to PDP limit).
Using 4 lines to pump into a Tower (2000 GPM); max distance is 300' (due to PDP limit).

CONCEPT 3

Volume of Water in a Hoseline:
Water is not compressible; therefore, volume can be defined by its weight.

Hose Diameter	Volume of Water
1-¾"	1 lb per foot
2"	1.5 lbs per foot
2-½"	2 lbs per foot
3"	3 lbs per foot
5"	8.3 lbs per foot